Summer 7-14-2021

The Trauma, Substance Use, and Crime Connection: Characteristics and Recidivism Outcomes of Adult Offenders

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DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
Psychology

The University of New Mexico
Albuquerque, New Mexico

July, 2021

ACKNOWLEDGEMENTS

First I would like to acknowledge the funding sources that generously supported this research: the University of New Mexico Graduate and Professional Student Association New Mexico Research Grant, the Sandia Casino Responsible Gaming Scholarship, the Benjamin Franklin Haught Memorial Scholarship Award, and the National Institute on Alcohol Abuse and Alcoholism training grant T32AA018108 (PI: McCrady).

Thank you to my mentor Barbara McCrady for consistently believing in and helping me cultivate my research agenda and career path over the past seven years. To my loving family and friends who cheered me on from thousands of miles northeast, selflessly honoring my ambitions no matter how far away from my roots they took me. To my fellow graduate students who provided inspiration, comfort, and laughs as we grew alongside and because of each other; that we continue to celebrate and heal each other is a testament to an extraordinary bond. To the clients and research participants who entrusted their vulnerability in me and remind me why I choose this work. And to the state of New Mexico for providing a beautiful backdrop to narrate this important chapter of my life. It has been a privilege.

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ABSTRACT

Despite exceptionally high rates of trauma and substance use among incarcerated offenders, treatments remain limited in scope and availability within the criminal justice system. Identifying shared underlying mechanisms and potential gender differences could facilitate the development of interventions to target the vicious cycle of trauma, substance use, and crime. This study aimed to test a novel conceptualization of trauma, substance use, and criminal history as a composite risk factor for recidivism, including posttraumatic world assumptions as a hypothesized mediator and gender as a potential moderator. Participants were adult offenders from a community corrections program. Due to many institutional barriers and recruitment delays, the resulting sample size (n = 14, 71.4% men, 50.0% Hispanic/Latino, M age = 36.9 years old) precluded inferential analyses. Regardless, descriptive findings revealed highly elevated histories of substance use, trauma, and posttraumatic stress disorder symptoms in the sample. Participants endorsed fairly negative world assumptions, which corresponded with higher levels of trauma. Over one-third of participants recidivated by the 3-month follow-up, primarily due to substance-related violations. Supplementary analyses of a local jail population (n = 135) found that a history of interpersonal trauma unexpectedly predicted lower rates of 12-month re-arrest, but this

finding was not statistically significant when controlling for gender. In both samples, women reported higher trauma and lower criminality at baseline than men. Findings and future directions are discussed within the context of study limitations, lessons learned about barriers to research in criminal justice settings, and broader perspectives gained from the events of the year 2020.

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CHAPTER 1

INTRODUCTION

Identifying the Problem

With 6.4 million adults under criminal justice system control (U.S. Bureau of Justice Statistics, 2020), the United States leads the world in incarceration rates. The sheer numbers and collateral consequences of incarceration, which disproportionally affect low-income and non-white communities, have been characterized as an epidemic requiring public health solutions (Dumont et al., 2012). Estimates of substance use disorder (SUD; Chandler et al., 2009; Fazel et al., 2017), trauma exposure (Ardino, 2012; Bodkin et al., 2019), and posttraumatic stress disorder (PTSD; Baranyi et al., 2018) among incarcerated offenders far exceed those in the general population. Mounting evidence points to reciprocal associations among trauma, substance use, and criminal behavior (e.g., Clark et al., 2014; Lynch et al., 2017; Martin et al., 2015; Zweig et al., 2015), which often develop into a cyclic triad with devastating consequences for offenders, their communities, and society (Hammersley, 2011). Despite these implications, there remains an unmet need to address this triad in offender treatment programs (Moore et al., 2020; Pettus-Davis et al., 2019; Taxman et al., 2013). Relatedly, little is known about specific mechanisms that link trauma, substance use, and crime (Ardino, 2012; Fritzon et al., 2021; Vujanovic et al., 2016). Studying underlying psychological mechanisms could ultimately generate promising interventions to apply in integrated treatment programs for offenders. Further, whether gender differences magnify the associations among trauma, substance use, and crime remains unclear (Kruttschnitt, 2013). Elucidating gender differences could help tailor treatment programming, which is often gender-segregated in criminal justice settings (Miller & Najavits, 2012).

One potential mechanism connecting trauma, substance use, and crime is world assumptions. World assumptions are negative cognitions about the world (e.g., "No one can be trusted," "The world is completely dangerous"; American Psychiatric Association, 2013, p. 272) that often develop following trauma and can interact with trauma memories to promote an ongoing sense of threat (Ehlers & Clark, 2000; Janoff-Bulman, 1989). Strong evidence supports the role of world assumptions in the development and maintenance of PTSD (Brown et al., 2019; LoSavio et al., 2017). World assumptions also appear to be malleable intervention targets in cognitive-behavioral treatments for PTSD (Diehle et al., 2014; Holliday et al., 2018). Moreover, world assumptions may mediate the association between trauma and substance use as a method of coping (Banerjee et al., 2018; C. E. Blevins et al., 2016; Fokas et al., 2020; Thompson & Kingree, 2010). Investigators have identified negative world assumptions and associated mental health concerns in incarcerated offenders (Maschi et al., 2010; Maschi & Baer, 2013; Maschi & Gibson, 2012), but have not studied this construct in direct relation to criminal behavior. However, criminologists have focused on the role of similar cognitive schemas in shaping violent offending (Polaschek et al., 2009) and sexual offending (Ó Ciardha & Ward, 2013). Altogether, several bodies of research support a model positing that world assumptions may be a cognitive mechanism underlying gender-moderated associations among trauma, substance use, and crime, with repercussions for offender recidivism that could build on existing knowledge about risk factors. The current study aimed to test this model toward the broader goal of generating ideas for future treatment development.

General Strain Theory

The general strain theory is a classic and prevailing theory of criminal behavior

(Agnew, 2001). This theory suggests that "strains" or stressors induce negative emotions that call for corrective action, of which criminal behavior is one such method. For example, theft may serve to ameliorate resource deprivation, and illicit substance may be a means to cope with affective stress. According to this theory, stressors are more likely to result in criminal corrective action when they are perceived as unjust, experienced as high in magnitude, associated with low social control, and paired with incentives to engage in crime.

It follows that traumatic victimization is one of the most researched forms of strain. Apel and Burrow (2011) elaborated on the trajectory from victimization to criminal behavior using a general strain theory perspective. They argued that for some individuals, crime is a form of conflict resolution—a legitimate method of deterrence from harm or retribution for personal transgressions. Criminal problem-solving is especially prevalent in disadvantaged, unstable environments where access to social services and legal recourse is limited. Individuals in these environments may feel helpless and be incentivized to engage in criminal forms of self-protection, such as gang membership for violence prevention or drug sales for economic vitality. The authors concluded that victimization fosters criminal behavior by undermining notions of personal agency, disturbing social networks, and increasing negative ideation (Apel & Burrow, 2011).

The general strain theory provides an all-encompassing theoretical framework for the study of traumatic experiences and substance use in criminal offenders, and is particularly relevant to the construct of negative world assumptions as a potential underlying mechanism. World assumptions (Janoff-Bulman, 1989) tap into the very idea of strains being perceived as unjust and undermining one's sense of control (Agnew, 2001). These negative cognitions in turn induce negative affective states (Ehlers & Clark, 2000) that may motivate substance use

(Hawn et al., 2020) or other forms of "criminal coping" (Agnew, 2001). It is through this broad lens that the current study was conceptualized and the following bodies of literature are interpreted.

The Trauma–Crime Connection

Research has consistently observed high levels of trauma exposure and subsequent PTSD among incarcerated offenders (Ardino, 2012; Fritzon et al., 2021). A meta-analysis of 29 studies of Canadian prisoners found that roughly half of the sampled individuals had a history of childhood abuse (Bodkin et al., 2019). Another study reported an average of 6.66 lifetime traumatic events among prisoners in Arizona (Carlson & Shafer, 2010). Regarding PTSD diagnosis, an international meta-analysis of 56 studies calculated pooled prevalence rates of 6% for incarcerated men and 21% for incarcerated women, noting considerable heterogeneity across studies (Baranyi et al., 2018). Exemplifying this heterogeneity, a study of female Scottish prisoners found that 91% of the women had histories of both childhood and adult trauma and 58% met the diagnostic threshold for current PTSD (Karatzias et al., 2018). In an epidemiological study of Black Americans, 90% of those with (versus 77% of those without) a history of arrest had experienced at least one traumatic event. Likewise, 11% of those with (versus 7% of those without) an arrest history met criteria for lifetime PTSD (Jäggi et al., 2016).

In light of these prevalence rates, researchers have identified a strong correlation between trauma and criminal behavior, with apparent dose-response patterns. In the above-cited epidemiological study, Black Americans' probability of criminal justice system involvement increased incrementally with a history of either 1, 2 to 3, or ≥ 4 traumatic events. Likewise, lifetime PTSD diagnosis among participants with any trauma history

strengthened the odds of criminal justice system involvement (Jäggi et al., 2016). In a study of juvenile offenders, the addition of each traumatic event increased the likelihood of becoming a serious, violent, and chronic offender by 35% (Fox et al., 2015).

The prevailing assumption, in line with general strain theory (Agnew, 2001), is that trauma is the causal variable in the link between trauma and crime. At a diagnostic level, PTSD can include symptoms of reckless and aggressive behavior (APA, 2013). However, some researchers have argued in favor of the opposite directionality, in which a criminal lifestyle increases the risk of trauma through proximity to dangerous environments and antisocial personalities (e.g., Turanovic et al., 2015). The rationale for this directionality is compounded by the reality that the criminal justice system itself is rife for trauma; trauma experienced within the criminal justice system (e.g., physical or sexual assault) may serve to perpetuate criminal behavior (Hammersley, 2011).

Although causality is methodologically difficult to establish, examining the temporal order of trauma and crime provides an estimation. For example, 44% of Israeli military veterans with PTSD (compared to 36% of those without PTSD) had a criminal record, and of that sub-sample, 65% had experienced trauma before committing crime (Sherman et al., 2014). Likewise, a recent study of incarcerated Canadian adults found that two-thirds of the sample reported experiencing victimization prior to incurring their first criminal charge (Bucerius et al., 2021). A similar methodological approach involves studying the relationship of trauma to recidivism among individuals with preexisting criminal behavior. Zweig et al. (2012b), for example, found that past-year victimization among adult offenders predicted continued criminal offending 18 months later, controlling for prior arrests. In another study, PTSD diagnosis (present in 22% of the jail inmates sampled)

predicted 1-year recidivism after controlling for recent arrests (Sadeh & McNiel, 2015).

Altogether, the body of literature on the trauma–crime connection can be conservatively summarized as representing reciprocal associations between the two phenomena. That is, trauma typically predates crime, and a criminal lifestyle and criminal justice system involvement often perpetuate further trauma (Hammersley, 2011). An understudied area of research, however, concerns the underlying mechanisms or mediators that may account for the relationship between trauma and crime (Ardino, 2012; Fritzon et al., 2021; Karatzias et al., 2018). In commenting on this gap in the literature, Sadeh and McNiel (2015, p. 583) proposed, "For instance, the hypervigilance to threat cues and tendency to interpret safe environments as dangerous that are specifically observed in PTSD may increase recidivism risk via an increase in suspiciousness that decreases prosocial attitudes and social affiliation, or increases reactive aggression." The present study aimed in part to fill this gap by testing the hypothesized mechanism of world assumptions.

The Substance Use–Crime Connection

The relationship between crime and substance use is very well-established. Like trauma and PTSD, specific rates of substance use and SUD differ by offender population but are consistently higher than those observed in non-offenders. One overview of the United States criminal justice system reported that 26-32% of adult inmates were under the influence of drugs at the time of their offense, and 50-56% used drugs in the month prior to their offense (Chandler et al., 2009). An international meta-analysis of 24 studies found that 24% of prisoners met criteria for past-year alcohol use disorder (AUD). The prevalence of past-year non-alcohol SUD was also high and varied substantially by gender, at rates of 30% for men and 51% for women (Fazel et al., 2017). Using 13 years of data from the National Study

on Drug Use and Health, Fearn et al. (2016) found that rates of past-year AUD and other SUD (inclusive of cocaine/crack, methamphetamine, hallucinogens, inhalants, tranquilizers, ecstasy, and/or stimulants) among probationers/parolees were 28% and 10%, respectively, compared to rates of 7% and 1% within the general population. In an analysis of the New Jersey prison system, Zgoba et al. (2020) found that 57% of inmates with SUD were re-arrested within 3 years of release, in contrast to 45% of inmates without SUD. Moreover, a meta-analysis of 20 years of recidivism data from across the United States concluded that substance use was among the top 8 predictors of recidivism (Katsiyannis et al., 2018).

As in the relationship between trauma and crime, the causal nature of the substance use–crime connection has been debated (Bennett et al., 2008; Menard et al., 2001). On the one hand, it is reasonable to surmise that substance use causes crime via neurobiological and behavioral dishibition and impulsivity (Chandler et al., 2009). Substance use may also cause crime through financial strain or involvement in the violent drug trade (Menard et al., 2001). Indeed, inmates often self-report that their criminal offenses likely would have not occurred had they not been intoxicated or seeking alcohol or drugs at the time (Young et al., 2021). On the other hand, developmental trajectories show that substance use and criminal behavior tend to emerge around the same time during adolescence (Hammersley, 2011; Menard et al., 2001). A criminal lifestyle can facilitate substance use through the influence of contextual norms and antisocial peers (Menard et al., 2001). Adding to the complexity, of course, is that substance use *itself* is criminalized.

Life course trajectory research has attempted to untangle the complex pathways between substance use and crime. Farabee et al. (2001) reported that among adults in SUD treatment, regular substance use preceded the initiation of criminal behavior in 87% of cases.

This majority group was more likely to engage in substance-related or "victimless" crimes including drug sales and prostitution, whereas individuals whose criminal activity preceded regular substance use were more likely to commit violent or predatory offenses including assault and theft. In a study of female Brazilian prisoners, Baltieri (2014) found that age of onset of both alcohol and drug use significantly predated the initiation of criminal behavior, which occurred simultaneously with substance-related problems. Sullivan and Hamilton (2007) provided a more nuanced perspective with evidence of several distinct trajectories of substance use and criminal behavior among groups of juvenile offenders. Although substance use and crime tended to ebb and flow together, some juveniles maintained high substance use while engaging in little to no criminal activity, whereas no juveniles were highly involved in crime in the absence of concurrent substance use.

Therefore, as in the relationship between trauma and crime, the link between substance use and crime can be most accurately described as reciprocal. Substance use typically causes, exacerbates, or itself constitutes criminal behavior, which in turn contextually normalizes and provides means to feed continued substance use (Farabee et al., 2001; Menard et al., 2001; Sullivan & Hamilton, 2007). Conceptualizing the trauma–crime and susbtance use–crime connections as reciprocal accounts for a range of individual differences, including the potential influence of third variables. Perhaps more importantly, this conceptualization captures the functional interdependence between behaviors that interventions should strive to target. The themes of mutual causation and overlapping intervention needs are also evidenced in the trauma–substance use connection, as reviewed below.

The Trauma–Substance Use Connection

PTSD and SUD have one of the highest comorbidity rates across various populations. In studies of individuals with SUD, estimates of trauma exposure are as high as 95%, and PTSD prevalence rates range from upwards of 42% for a current diagnosis to 52% for a lifetime diagnosis (Vujanovic et al., 2016). Similarly, approximately half of all individuals with PTSD are estimated to have concurrent SUD, and individuals with (versus without) PTSD are up to 14 times more likely to have an SUD diagnosis (McCauley et al., 2012). These patterns of comorbidity have replicated in incarcerated offenders specifically (Facer-Irwin et al., 2019; Proctor & Hoffmann, 2012). As in the link between trauma and crime, there is evidence of a dose-response relationship between trauma and substance use (Haller & Chassin, 2014). For example, in one study of incarcerated women, the accumulation of each childhood traumatic event increased the probability of SUD by 25% (Friestad et al., 2014).

Research on the etiological underpinnings of comorbid PTSD-SUD has generated four competing hypotheses (Hawn et al., 2020; McCauley et al., 2012; Vujanovic et al., 2016). Briefly, these hypotheses are: (a) Self-medication: substance use is a means of coping with the effects of trauma; (b) High-risk pathway: substance use increases the likelihood of trauma exposure through risky lifestyle choices; (c) Susceptibility: holding trauma exposure equal, people who use substances are more likely to develop PTSD due to diminished emotion regulation and coping capacities; and (d) Shared vulnerability: trauma/PTSD and substance use/SUD are indirectly related through common underlying causes. A seminal test of these four hypotheses found strong support for the self-medication hypothesis and slight evidence for the susceptibility hypothesis (Chilcoat & Breslau, 1998). Using a similar longitudinal design, a more recent investigation found strong support for the self-medication

hypothesis and partial support for the high-risk hypothesis (Haller & Chassin, 2014). Although neither study found evidence for the shared vulnerability hypothesis, other researchers have drawn on neurobiological and genetic findings to bolster this position (María-Ríos & Morrow, 2020).

Returning to the theme of bidirectionality, the body of literature on the trauma–substance use connection suggests dynamic trajectories in which the two phenomena interact and exacerbate each other (McCauley et al., 2012; Vujanovic et al., 2016). Most often, trauma has temporal precedence over substance use (Chilcoat & Breslau, 1998; Haller & Chassin, 2014). Even among adult offenders with pre-existing substance use problems, recent traumatic victimization predicted increased substance use, controlling for past use and other risk propensity variables (Zweig et al., 2012a). In turn, ongoing substance use can heighten the risk of further trauma and impede healthy coping processes that normally protect individuals against the development of PTSD (McCauley et al., 2012; Vujanovic et al., 2016). Said differently, posttraumatic substance use often functions as a method of avoidance coping, which tends to backfire. This maladaptive cycle of self-medication has been documented in criminal offenders specifically, whose use of substances to cope with trauma increased the odds of PTSD (Grella et al., 2013) and negative substance use consequences (Asberg & Renk, 2012). The complex entanglement of substance use and trauma thus requires an integrated treatment approach that targets mechanisms that underlie both phenomena (Flanagan et al., 2016). However, research on mechanisms and integrated treatment targets for this common comorbidity remains limited (Vujanovic et al., 2016).

Connecting the Connections: The "Risk Triad"

The above-reviewed research on the interrelationships among trauma, substance

use, and crime underscores a large swath of individuals who are involved in the criminal justice system. It is clear that criminal offenders present with disproportionate rates of trauma/PTSD (Bodkin et al., 2019) and substance use/SUD (Fazel et al., 2017), which are often comorbid (Facer-Irwin et al., 2019). Much scholarship has focused on the "victim-offender overlap" (e.g., Ardino, 2012; Bucerius et al., 2021) in addition to the prominent role of substance use in both victimization (e.g., Hawn et al., 2020; Vujanovic et al., 2016) and offending (e.g., Chandler et al., 2009; Young et al., 2021). It follows that many studies have outlined pathways to criminal behavior stemming from trauma (e.g., Sadeh & McNiel, 2015; Sherman et al., 2014) and substance use (e.g., Baltieri, 2014; Zgoba et al., 2020). When combined, the relationships among these variables quickly become blurry and entangled.

Several studies have examined trauma, substance use, and criminal behavior together. For example, Grella et al. (2005) found that childhood sexual abuse was related to adult criminal behavior both directly and indirectly via adolescent substance use in a sample of incarcerated women. In another study of incarcerated women, a latent mental health variable consisting of lifetime PTSD, SUD, and serious mental illness mediated the association between lifetime victimization experiences and criminal behavior (Lynch et al., 2017). Similarly, Broidy et al. (2018) observed a direct trajectory from childhood abuse to internalizing mental health symptoms, onset of criminal offending, regular drug use, and subsequent property offending among incarcerated women. A study of incarcerated men found that PTSD, but not SUD, was related to the number of prior jail bookings (Proctor et al., 2017). In mixed-gender studies, Zweig et al. (2015) demonstrated that in-prison victimization predicted post-release violent crime and substance use through mechanisms of hostility and depression, respectively. Clark et al. (2014) compared adults who presented

with trauma only, substance use only, and comorbid trauma and substance use, finding that the comorbid group had higher levels of violent offending (but not property offending). Finally, Martin et al. (2015) reported that trauma history was related to in-prison violence perpetration both directly and indirectly via substance use, mental health symptoms, and youth criminal history.

The precise etiology of the relationships among trauma, substance use, and crime continues to be debated and explored (e.g., Haller & Chassin, 2014; Sullivan & Hamilton, 2007; Turanovic et al., 2015). However, decades of literature have construed the following pathways: (1) Trauma typically predates substance use, with substance use functioning as self-medication of posttraumatic distress; (2) Substance use can facilitate criminal behavior through lowered inhibition, financial demand, and drug-related offenses; and (3) Substance use, a criminal lifestyle, and criminal justice system involvement increase the risk of further trauma, (4) thereby perpetuating a vicious cycle (Hammersley, 2011; Moloney et al., 2009). This spiraling pattern of adversity is consistent with the general strain theory of crime (Agnew, 2001).

The overlapping and cyclic nature of these variables lends itself to a novel conceptualization of trauma, substance use, and criminal history as a composite latent variable. This variable, herein coined the “risk triad,” was developed in the current study to characterize the histories and ongoing difficulties of many adult offenders. Although understanding developmental pathways is important, debates about causality may distract from the reality that adults who are stuck in a cycle of trauma, substance use, and crime require integrated solutions. Identifying common psychological mechanisms to target in interventions is one such solution. However, research on mechanisms and treatment targets

remains underdeveloped in the bodies of literature reviewed above (Ardino, 2012; Fritzon et al., 2021; Karatzias et al., 2018; Vujanovic et al., 2016). Importantly, such an approach should not ignore the socioeconomic inequities and systems of marginalization that foster "the risk triad" (Dumont et al., 2012; Seddon, 2006) and that play a considerable role in offenders' high rates of recidivism (Katsiyannis et al., 2018). Rather, empirically-based mental health interventions provide a unique opportunity to begin disrupting harmful patterns of behavior that more broadly require comprehensive interdisciplinary reform. Specific treatment considerations for the "risk triad" are presented at the conclusion of this literature review.

Gender and the "Risk Triad"

A gender-informed general strain theory perspective recognizes that gender norms and disparities are likely to influence the contextual and behavioral variables that form pathways to crime (Broidy & Agnew, 1997). Many researchers have highlighted trauma and substance use as central features in the criminal trajectories of women in particular (Moloney et al., 2009). Indeed, meta-analyses have shown that incarcerated women present with higher rates of childhood sexual abuse and neglect (Bodkin et al., 2019), PTSD diagnosis (Baranyi et al., 2018), and illicit drug use (Fazel et al., 2017) compared to their male counterparts. With that said, these elevated prevalence rates do not necessarily indicate that trauma and substance use exert more powerful, unique effects on the offending trajectories of women (Kruttschnitt, 2013).

A noted shortcoming of the literature on women's pathways to crime is that most studies have relied on exclusively female samples of participants (Kruttschnitt, 2013). Such an approach precludes the ability to systematically test gender differences or gender

moderation. An exception was a seminal study of both male and female inmates by McClellan et al. (1997), who concluded that trauma, substance use, and crime encompassed "the tragic sequelae for the women" (p. 473), who showed stronger trauma–substance use and substance use–crime associations than men. However, more recent mixed-gender investigations of the "risk triad" interrelationships have found no evidence of moderation by gender (Giarratano et al., 2020; Martin et al., 2015; Messina et al., 2007; Turanovic et al., 2015; Zweig et al., 2015). Two of these studies, it should be noted, recruited substantially more males than females and questioned their statistical power to detect gender moderation (Martin et al., 2015; Zweig et al., 2015). Adding to the uncertainty, a recent meta-analysis found that PTSD co-occurred with SUD more often among incarcerated men than women (Facer-Irwin et al., 2019). Therefore, additional research directly comparing men and women is needed to unpack the common belief that trauma and substance use are uniquely salient in women's pathways to crime and recidivism (Kruttschnitt, 2013). Clarifying such gender differences could have important implications for offender treatment programming, which is often delivered in gender-segregated settings and has seen increased advocacy to be gender-informed (Gobeil et al., 2016; Miller & Najavits, 2012).

World Assumptions as a Mechanism

World Assumptions and Trauma

In assumptive world theory, Janoff-Bulman (1989) proposed that most individuals possess the following fundamental schemas or positive *world assumptions*: (a) perceived benevolence, including beliefs about benevolence of the world (that good outcomes outweigh bad outcomes) and benevolence of people (that people are basically kind and caring); (b) meaningfulness of the world, including assumptions of justice (that people get what they

deserve based on their character) and controllability (that people get what they deserve based on their behavior), with a de-emphasis on randomness (that outcomes are a matter of chance alone); and (c) self-worthiness, including beliefs about self-worth (that one has a positive moral character), self-controllability (that one is reasonably capable of controlling outcomes), and luck (that one will be protected from ill fortune). These optimistically-biased schemas facilitate development of a healthy sense of security. Assumptive world theory argues that traumatic events rapidly violate these world assumptions, creating a cognitive discrepancy that causes overwhelming distress (Janoff-Bulman, 1989).

To account for the discrepancy between positive world assumptions and the experience of trauma, individuals engage in processes of assimilation—modifying their interpretations of the trauma to fit their existing beliefs—and accommodation—modifying their broader beliefs to make sense of the trauma. Accordingly, common initial posttraumatic reactions such as denial and self-blame represent efforts at assimilation. Overtime, however, individuals with enduring posttraumatic stress show a tendency toward over-accommodation, in which their fundamental world assumptions become rigidly negative. For individuals with pre-existing negative world assumptions (due to factors such as psychopathology and other life adversity), traumatic events often serve to confirm or strengthen their negative beliefs (Janoff-Bulman, 1989; Resick et al., 2016).

The cognitive model of PTSD by Ehlers and Clark (2000) built on assumptive world theory by proposing that enduring negative trauma-related appraisals interact with intrusive trauma memories to produce a pervasive sense of threat. This sense of threat, experienced as heightened arousal and emotional distress, upholds negative cognitive appraisals and creates a feedback loop of PTSD symptomatology. Indeed, much longitudinal evidence supports the

role of world assumptions in the development (e.g., Meiser-Stedman et al., 2009; Wild et al., 2016), maintenance (e.g., Dekel et al., 2013; Palosaari et al., 2013), and remission (e.g., Kleim et al., 2013; Kumpula et al., 2017; Scher et al., 2017) of PTSD and related mental health symptoms (for comprehensive reviews, see Brown et al., 2019 and LoSavio et al., 2017). Given this evidence, negative cognitions about the world (e.g., "No one can be trusted," "The world is completely dangerous") were added as a symptom of PTSD in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5*; APA, 2013, p. 272).

World Assumptions and Substance Use

The cognitive model of PTSD elaborates that individuals with PTSD respond to negative trauma-related appraisals and the associated sense of threat with methods of avoidance coping (Ehlers & Clark, 2000). Avoidance is a required diagnostic feature of PTSD in the *DSM-5* (APA, 2013) and can manifest as substance use. Individuals with PTSD may turn to alcohol or drugs to numb feelings of distress or arousal, cloud intrusive trauma memories, or otherwise distance themselves from the trauma. Substance use in turn may maintain PTSD symptoms by preventing the individual from appropriately confronting and processing their trauma memories and appraisals (Ehlers & Clark, 2000). This theoretical paradigm is consistent with the self-medication hypothesis regarding the trauma–substance use connection as reviewed earlier (see Hawn et al., 2020).

Several studies have supported the premise that world assumptions are a specific mechanism underlying the relationship between trauma and substance use, although research on this question is still in its nascence. The extant body of literature includes cross-sectional evidence that world assumptions (a) were associated with alcohol craving in men with

comorbid PTSD-AUD (Jayawickreme et al., 2012), (b) moderated the PTSD-SUD comorbidity in psychiatrically hospitalized adolescents (Allwood et al., 2014), (c) mediated the relationship between sexual victimization history and alcohol-related consequences in college women (Thompson & Kingree, 2010), (d) mediated the association between PTSD symptoms and drinking among sexual minority men (Banerjee et al., 2018), and (e) were related indirectly (but not directly) to alcohol craving via negative affect in veterans with comorbid PTSD-AUD (Lyons et al., 2020). Further, longitudinal investigations have found that world assumptions mediated the relationship between PTSD symptoms and reckless behavior (including drug use and driving while intoxicated) in school shooting survivors (C. E. Blevins et al., 2016) and mediated the link between interpersonal trauma history and post-treatment drinking among adults enrolled in AUD treatment (Fokas et al., 2020). One study, conversely, found that world assumptions did not mediate the longitudinal association between sexual victimization history and problem drinking in college students (Blayney et al., 2016). No known studies have examined world assumptions in relation to substance use among criminal offenders specifically, a gap which the present study sought to fill.

World Assumptions and Crime

In the general strain theory of crime, Agnew (2001) proposed that trauma may deplete "cognitive coping" resources that normally minimize and protect individuals against injustices; individuals may resort to "criminal coping" when these cognitive resiliency factors are depleted. Criminal coping occurs most often in economically- and socially-disadvantaged environments, in which inadequate access to prosocial means of resolving trauma (e.g., legal recourse, mental health services) may make individuals feel limited to criminal forms of retribution or self-protection (Apel & Burrow, 2011). Committing crime in

turn may uphold negative cognitive schemas as a means of justifying or normalizing one's behavior (Maruna & Mann, 2006).

Only a few studies by a single research group have assessed world assumptions in criminal offenders. In their first study, Maschi et al. (2010) found that among adolescent male offenders, a history of cumulative trauma was related to negative world assumptions about meaningfulness of the world, but not perceived benevolence or self-worthiness (as defined by Janoff-Bulman, 1989). A similar investigation with adult male prisoners showed that cumulative trauma was associated with negative world assumptions about meaningfulness and self-worthiness but not benevolence (Maschi & Gibson, 2012). A third study based on a much larger sample of incarcerated men identified three latent classes: (a) "a highly resilient group" of inmates who endorsed generally positive world assumptions, (b) inmates who reported positive world assumptions related to themselves but negative world assumptions about others ("a group who liked themselves, but no one else"), and (c) inmates with uniformly negative world assumptions, who also endorsed higher levels of anxiety, depression, hostility, and paranoia (Maschi & Baer, 2013, p. 65). Surprisingly, however, the three groups did not significantly differ in trauma history.

In their discussion, Maschi and Baer (2013) speculated that negative world assumptions may encourage criminal behavior by reducing a sense of prosocial responsibility or accountability for one's actions. Offenders may also rationalize crime as a method of "taking justice 'into their own hands'" in a harsh and unfair world (p. 71). However, none of the above-cited studies examined world assumptions in direct relation to criminal behavior. The closest approximation to this work was Lujan and Fanniff's (2019) study of juvenile detainees, who were more likely to commit institutional misconduct if they perceived the

detention center as an unsafe environment. Related research in criminology has identified specific cognitive distortions that may influence sexual offending in men, including perceptions that the world is dangerous, women are untrustworthy, and one is externally controlled (for a review, see Ó Ciardha & Ward, 2013). Similar cognitive schemas including hostile attributions have been identified among violent offenders (Polaschek et al., 2009). This line of research has relied primarily on offenders' explanations for their crimes, a method that invites bias (Maruna & Mann, 2006). Nonetheless, this body of work has provided tangential support for the hypothesis that negative world assumptions are connected to criminal offending.

Treatment Implications and Applications

The State of Treatment for the "Risk Triad"

The Substance Abuse and Mental Health Services Administration (SAMHSA, 2014) has long called for increased implementation of SUD treatment in criminal justice settings. A national survey in 2007 showed that only 10% of incarcerated offenders received some form of SUD treatment, which often was limited in scope and empirical support (Taxman et al., 2013). Fortunately, the past 10 years have seen an uptake in stakeholder interest and investment in SUD treatment for offenders. Many research studies have found that SUD treatment reduces criminal recidivism, despite significant variation in treatment modality and a lack of consensus on best practices (Moore et al., 2020). The movement to address trauma in offender treatment programs has also slowly gained traction, with proponents emphasizing trauma-informed principles of safety, hope, autonomy, respect, and empathy (J. S. Levenson & Willis, 2019). A 2017 survey of all 50 state prison systems found that 76% of states reported offering some form of trauma treatment, although the empirical support for

treatments was unclear (Pettus-Davis et al., 2019). Preliminary evidence has suggested that trauma treatment reduces recidivism (Miller & Najavits, 2012; Pettus-Davis et al., 2019), encouraging continued development of such programming. Nearly all of the literature on trauma treatment has focused on incarcerated women specifically (Pettus-Davis et al., 2019), overlapping with the push for gender-informed care (Gobeil et al., 2016). Within the broader clinical landscape, there are barriers to receiving integrated treatment for trauma/PTSD and substance use/SUD; individuals are traditionally assessed and treated for one of these conditions at the exclusion of the other (Flanagan et al., 2016; Vujanovic et al., 2016). However, the recent rise of Concurrent Treatment of PTSD and SUDs Using Prolonged Exposure (COPE; Back et al., 2019) has shown that it is possible to effectively treat both disorders simultaneously. Altogether, the growing recognition of offenders' integrated treatment needs (Wallace et al., 2011) represents an opportunity for researchers to develop innovative interventions that target trauma, substance use, and criminal behavior together.

Interventions Targeting World Assumptions

Meta-analyses have shown that world assumptions are malleable intervention targets in empirically-supported PTSD treatments (Diehle et al., 2014; Holliday et al., 2018). The leading treatment for this purpose is cognitive processing therapy (CPT; Resick et al., 2016). In CPT, therapists work with clients to identify and challenge maladaptive posttraumatic cognitions or "stuck points" related to safety, trust, power/control, esteem, and intimacy. Over the course of 12 individual or group sessions, therapists help clients understand the triggers and consequences of stuck points, challenge stuck points using Socratic questioning, and practice reframing cognitions toward more adaptive, flexible beliefs. These cognitive processes are directly implicated in treatment outcomes, with

evidence indicating that changes in maladaptive cognitions precede rather than follow reductions in PTSD and related symptomatology (Cooper et al., 2017; Kleim et al., 2013; Schumm et al., 2015).

Research over the past 5 years has highlighted a burgeoning interest in adapting CPT to the treatment of comorbid PTSD and SUD. In the only known randomized clinical trial with this goal, veterans who received CPT augmented with relapse prevention strategies had greater reductions in heavy drinking and roughly equivalent PTSD and depression outcomes compared to the control group. These results were encouraging in that the control group also received a strong treatment that incorporated cognitive restructuring related to substance use and depression but not trauma (Haller et al., 2016). In a single-condition study, CPT augmented with 12-step, cognitive-behavioral, and motivational interventions for SUD appeared to reduce PTSD, depression, and trauma-cued substance craving in veterans. Negative trauma-related cognitions also decreased over the course of the treatment, which mediated the observed reductions in PTSD and depression but not substance craving (Peck et al., 2018). Most recently, a pilot study of CPT with adjunctive pharmacotherapy led to decreases in alcohol use, craving, and PTSD symptoms among veterans (Petrakis et al., 2020). Although no known studies have implemented CPT with adult offenders, two trials of CPT for juvenile offenders found that the treatment improved PTSD symptoms (Ahrens & Rexford, 2002; Ovaert et al., 2003). It remains to be tested whether an adapted CPT-based intervention could curb offender substance use and recidivism outcomes.

The Present Study

The present study sought to integrate and expand on the interdisciplinary literature reviewed above. Although previous research has established reciprocal relationships among

trauma, substance use, and criminal behavior, no known study has examined these three phenomena together as a single latent variable representing offender risk—a "risk triad"—with a hypothesized link to criminal recidivism. Much work remains to identify specific mechanisms that underlie the connections among trauma, substance use, and crime. Previous research has provided strong support for the role of negative world assumptions in posttraumatic reactions, preliminary evidence that world assumptions mediate the association between trauma and substance use, and tangential evidence that world assumptions may influence criminal behavior. It was thus hypothesized that world assumptions may be a cognitive mechanism mediating the pathway from the "risk triad" to recidivism. This potential mechanism is clinically viable given evidence that world assumptions are malleable intervention targets that drive symptom outcomes in treatments such as CPT. Evidence for these novel hypotheses would support future research to apply an adapted CPT-based intervention to disrupt the "risk triad" cycle and ideally help reduce rates of offender recidivism. Finally, this study sought to clarify mixed findings on gender differences by hypothesizing that the "risk triad" would predict recidivism more strongly for female than male offenders, which could further guide intervention development.

The study population comprised men and women enrolled in the Community Custody Program (CCP) of Bernalillo County, New Mexico, United States. The CCP is an intensive community-based alternative to incarceration in which eligible lower-risk adult offenders are restricted to home and work, mandated to sobriety and treatment, and monitored via ankle bracelet and daily communication. This prospective study aimed to examine trauma, substance use, and crime as a co-occurring "risk triad," unconstrained by questions of causation or directionality, in predicting 3-month CCP recidivism rates. The

study included three specific aims and four corresponding hypotheses, which are illustrated together in the proposed analytic model in Figure 1.

Aims and Hypotheses

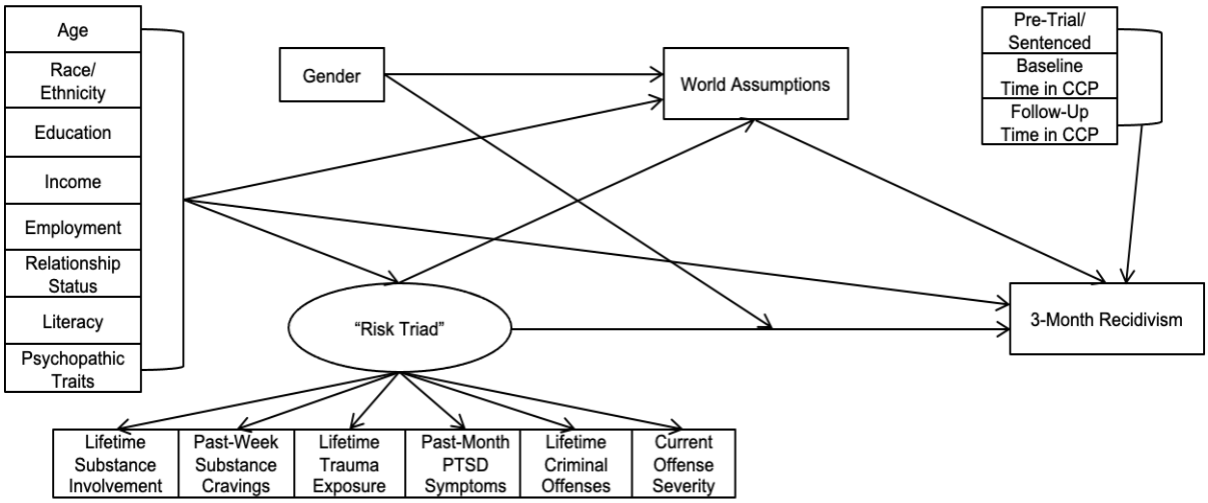
- Aim 1: To examine trauma, substance use, and crime as a "risk triad" predicting recidivism.
    - Hypothesis 1: History of (a) trauma (number of lifetime traumatic events, current PTSD symptom severity), (b) substance use (past alcohol and drug consumption and consequences, current alcohol and drug craving), and (c) criminal behavior (number of lifetime criminal offenses, severity of the current offense) will form a composite "risk triad" latent variable among the CCP offenders.
    - Hypothesis 2: A more severe "risk triad" at baseline will predict a greater likelihood of recidivism 3 months later (including use of alcohol or drugs, failure to report to staff, or other CCP violations).
- Aim 2: To test world assumptions as a mediator in the association between the "risk triad" and recidivism.
    - Hypothesis 3: More negative world assumptions will mediate the positive association between the "risk triad" and 3-month recidivism.
- Aim 3: To test gender as a moderator of the association between the "risk triad" and recidivism.
    - Hypothesis 4: Gender will moderate the positive association between the "risk triad" and 3-month recidivism, with the association being stronger for women than for men.

Supplementary Aim. Given significant barriers to study implementation and

recruitment, including the arrival of the COVID-19 pandemic, Aims 1-3 were impeded by a small sample size. Therefore, a supplementary aim was added to also examine relationships among the "risk triad" variables (lifetime history of trauma, substance use, and criminal offenses) and 12-month follow-up recidivism rates within a sample of jail inmates from the same geographic location, to the extent that the secondary data mapped onto the constructs and variables of the primary study.

Figure 1

Hypothesized Final Model



CHAPTER 2

METHOD

Participants

Setting

Participants were adult men and women in the custody of the Metropolitan Detention Center Community Custody Program (CCP) of Bernalillo County, New Mexico, United States. The CCP is an intensive community supervision program that offers lower-risk adult offenders (i.e., those not charged with serious violence or those without an extensive criminal history) an alternative to jail at any point during their pre-trial or sentenced period. Community-based supervision programs such as the CCP have become popular across the United States as they are increasingly recognized as safe, effective, and economically advantageous compared to jail or prison (Ziedenberg, 2014). CCP inmates are closely monitored via ankle bracelet and daily phone communication and are required to remain at home when not participating in mandated activities including twice-weekly visits to the CCP office in downtown Albuquerque. Additional mandated activities are rehabilitation-focused, including participation in mental health treatment, mutual-help groups (e.g., Alcoholics Anonymous meetings), education programs, and/or employment. CCP inmates must refrain from illegal activity, produce negative results on random alcohol and drug tests, and consent to random home visits to remain in the program. Any violation of CCP rules leads to prompt arrest and jail time. Following a violation, an inmate may remain in jail or be reinstated in the CCP at the discretion of a judge or other official.

A preliminary review of the CCP conducted by the University of New Mexico Institute for Social Research (Freeman, 2006) provided descriptive statistics about this

population. At the time of that report, the CCP supervised approximately 1,000 inmates per year with up to 250 inmates enrolled on any given day. The average age of inmates was 33, and approximately 28% of CCP inmates were women. About 64% of CCP inmates identified as Hispanic/Latino, 23% as White, 7% as Native American, 5% as African American, and less than 1% as Asian. Over half of CCP inmates (59%) were serving time for a misdemeanor (versus felony) offense, and only 5% of inmates were serving time for a violent offense. Approximately 29% of CCP inmates were pre-trial and awaiting sentencing. The average length of stay in the CCP was 75 days (median of 44 days). Approximately 31% of inmates were arrested for a CCP violation, which occurred on average within the first 51 days (median of 30 days) of CCP enrollment. The most common types of violations were a positive drug test, positive alcohol test, and failure to report to staff within a 24-hour period (Freeman, 2006).

In line with the current study's broader goal of informing future treatment efforts, CCP administrators expressed interest in using the study results to better understand their population's mental health needs and to update their community treatment referral network accordingly. CCP inmates are well-situated for this broader clinical goal in that they are lower-risk and have relative environmental stability, likely rendering them more amendable to psychological interventions.

Eligibility Criteria

Men and women (age 18 or over) under CCP supervision were eligible for the study if they had entered the CCP within the past 1 month. This timeframe was selected because CCP inmates were previously found to be at the highest risk for recidivism within the first 2 months of admission (Freeman, 2006). CCP inmates were not eligible for the study if they

demonstrated (a) active psychosis based on *DSM-5* diagnostic screening criteria, (b) gross cognitive impairment according to a standardized measure of mental status, or (c) limited English speaking ability per inmate self-report or interviewer determination. These variables were selected as exclusion criteria because they were likely to impair an inmate's ability to provide informed consent and/or accurate data. Given the importance of maximizing variability in trauma, substance use, and crime to analyze the interrelationships among them, CCP inmates were eligible regardless of their trauma, substance use, and criminal histories. The screening measures and procedures for determining study eligibility are described further below.

Desired Sample Size

Based on the available CCP enrollment data and a 15-month recruitment timeline, it was expected that the study would have a pool of approximately 1,200 inmates from which to recruit. The original goal was to obtain a final sample of 400 inmates. According to Fritz and MacKinnon's (2007) sample size guidelines for mediation analyses, a sample of 400 would have been sufficient to detect a conservatively estimated small to medium effect size for the association between the "risk triad" and world assumptions (*a*-path in the mediation model) and a small effect size of the association between world assumptions and recidivism (*b*-path in the mediation model) at a power level of .80. To detect potential moderation by gender, the aim was to recruit at least 100 women, which was feasible given that 28% of the CCP population was female (Freeman, 2006). With 100 women and 300 men there would have been sufficient power (> .80) to detect a medium moderation effect (Cohen's $d > .31$) and to inform power estimates for future research.

Actual Sample Size

Unfortunately, countless obstacles delayed the development and implementation of the study. The study timeline and major obstacles are illustrated in Figure 2, and will be discussed throughout this report. Briefly, there was a 14-month lag between the time of the dissertation proposal and the beginning of participant recruitment. This lag largely stemmed from high staff turnover within the CCP, special caution exercised in study approval processes, and the related need for repeated efforts at communication by the study Principal Investigator (PI). After recruitment and data collection began, there was a slow uptake of interest in the study, in part due to low CCP enrollment numbers of approximately 70 inmates on a given day (versus 250 inmates documented by Freeman in 2006). Although all CCP inmates were presented with study recruitment materials and contact information, and many inmates verbally expressed their interest in the study to CCP staff, only a small percentage of the inmate population contacted the researcher. This was likely due to inmates' shifting schedules, competing priorities, and an initial lack of visibility and easy accessibility of research staff. Seven months into recruitment, only 13 inmates had been screened and 4 inmates recruited into the study. The pace of recruitment increased substantially during the eighth month following the implementation of new recruitment procedures. Unfortunately, however, this pace was quickly interrupted by the COVID-19 pandemic and the university's indefinite suspension of in-person research. The final sample included 14 participants of a total of 25 inmates who were formally screened for the study. Of the 15 ineligible inmates, 6 had been admitted to the CCP more than 1 month prior, 4 were unable to be scheduled or rescheduled for the research interview, and 1 scored in the range of gross cognitive impairment.

Sample Demographics

Table 1 displays the demographic characteristics of the 14 consented participants. The sample comprised 10 (71.4%) men and 4 (28.6%) women. The average age of the sample was 36.86 (*SD* = 7.41, range = 26-48) years old. For race/ethnicity, half of participants identified as Hispanic/Latino, 3 (21.4%) as Native American/Alaska Native, 3 (21.4%) as White, and 1 (7.1%) as multiracial; no participants identified as Black/African American or Asian/Pacific Islander. In terms of marital/relationship status, 2 (14.3%) were married, 3 (21.5%) were cohabitating with a partner (but not married), 2 (14.3%) were in a committed relationship (but not cohabitating), 6 (42.9%) were single, and 1 (7.1%) was separated. Educationally, 3 (21.4%) participants had obtained a bachelor's degree, 4 (28.6%) had an associate's degree, 3 (21.4%) had a high school diploma, 1 (7.1%) had a trade school certificate, 2 (14.3%) had a graduate equivalent degree (GED), and 1 (7.1%) had no degree. Full-time or part-time employment was reported by 8 (57.1%) participants, whereas close to half of the sample was unemployed (6, 42.9%). Household income varied substantially across the sample (*M* = $21,236, range = $0-125,000, median = $12,500). An equal number of participants (7, 50.0%) were serving time in the CCP for misdemeanor and felony charges. The majority (10, 71.4%) of participants had already been convicted and sentenced, whereas 4 (28.6%) were in the pre-trial phase. On average, participants had entered the CCP 18.50 days before the study baseline (*SD* = 14.71, range = < 1-53). Finally, the vast majority of participants reported a "very good" ability to speak in English (13, 92.9%) and read in English (12, 85.7%), with the remaining participants rating their English abilities as "good."

Measures

Table 2 summarizes the study assessment battery including the purpose, format, approximate time requirement (in minutes), and timepoint of administration for each

measure.

Demographics and Eligibility Measures

Demographics. A demographics interview was developed to assess whether CCP inmates were eligible for the study, based initially on their program admission date. Inmates who had entered the CCP more than 1 month prior (n = 6) were excluded at this time. Those who remained eligible were asked additional questions about current legal status (felony or misdemeanor charge, pre-trial or sentenced case), gender, race/ethnicity, marital/relationship status, employment status, income, and education level, all of which were proposed as covariates in the hypothesized analytic model. Inmates also were asked to rate their ability to speak and understand English as "barely," "somewhat," "good," or "very good," and the interviewer had discretion to consider their interactions with the inmate to make a final rating. Inmates whose English speaking ability was rated as "barely" or "somewhat" would have been excluded from the study at this time; no inmates were excluded for this reason. Using this same ranking scale, inmates were also asked to rate their ability to read in English. Responses to this item did not affect study eligibility, but determined whether the participant would be administered all study questionnaires orally (in cases where reading ability was rated as "barely" or "somewhat"). Later, during the informed consent process (see below), participants' proficiency at reading the consent quiz items aloud was factored into a final rating of literacy, which was proposed as an analytic covariate.

Psychotic Disorder Symptoms. The psychotic disorder screening portion of the *DSM-5* Diagnostic Interview (Nussbaum, 2013) screened inmates for the exclusion criterion of active psychosis. This screening interview contains 5 items to detect visual hallucinations, auditory hallucinations, paranoid/persecutory delusions, delusions of grandeur, and delusions

of reference. Inmates who provided initial responses of "yes" were asked a series of follow-up questions, such as whether they had experienced the symptom strictly while under the influence of a substance (warranting a final interviewer rating of "no"). In almost all cases, affirmative responses were not indicative of genuine psychosis; for example, one participant who responded "yes" to the question of whether the TV or radio had ever referred to him explained that his crime had been broadcast on television. A final "yes" rating on any of the five psychotic disorder screening items would have resulted in exclusion from the study; no inmates were excluded for this reason.

Cognitive Functioning. The Mini-Mental State Examination (MMSE; Folstein et al., 1975) was used to screen inmates for the exclusion criterion of gross cognitive impairment. The MMSE is a 30-item, interviewer-administered test of cognitive functioning including simple orientation, attention, recall, verbal abilities, and visuospatial skills. Each item is scored as 0 or 1, summing to a maximum score of 30. Population-based normative data have identified a score of 24-30 as suggestive of no cognitive impairment. Accounting for education level, a score of < 22 is considered impaired for individuals with an eighth-grade education (Crum et al., 1993). Therefore, inmates who scored < 22 on the MMSE (n = 1) were excluded from study participation.

Substance Use History Measures

Lifetime Substance Involvement. The National Institute on Drug Abuse (NIDA)-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NM ASSIST; NIDA, 2009) measured lifetime substance use. Initially developed by the World Health Organization as a structured interview, the NM ASSIST has been successfully adapted to a self-report format (McNeely et al., 2014; Wolff & Shi, 2015), as was utilized in this study.

The NM ASSIST was further adapted in this study to include alcohol in addition to the 9 standard drug categories: cannabis, cocaine, prescription stimulants, methamphetamine, inhalants, sedatives or sleeping pills, hallucinogens, street opioids, and prescription opioids. Each item on the NM ASSIST elicited 10 independent responses (1 per substance category). Question 1 asked participants to indicate whether they had ever used each substance (yes/no) and, if applicable, their age of onset of use. The remaining items of the NM ASSIST assessed for alcohol and drug consumption and consequences using a Likert-type scale. Questions 2-5, which normally ask about the past 3 months, were modified in this study to reflect the 3 months prior to incarceration for the current offense, before participants were mandated to sobriety. These modified instructions were previously implemented with another incarcerated sample (Wolff & Shi, 2015). Questions 6-7 of the NM ASSIST broadened the timeframe to capture lifetime problematic substance use. Per the standard scoring instructions, responses to questions 2-7 summed to a substance involvement/risk score for each of the 10 substance categories. Substance involvement scores of 0-3 indicate low risk, 4-26 indicate moderate risk, and 27-39 indicate high risk (NIDA, 2009). The self-report version of the NM ASSIST, including the modified instructions for incarcerated samples, has previously demonstrated good psychometric properties including test-retest reliability and criterion validity (McNeely et al., 2014; Wolff & Shi, 2015).

Past-Week Substance Cravings. The Penn Alcohol Craving Scale (PACS; Flannery et al., 1999) quantified substance cravings during the past week. Given that participants were mandated to sobriety, this measure was selected to capture a potentially residual symptom of SUD. The PACS has 5 items that are self-rated on a 7-point Likert-type scale (maximum score = 30). Although the PACS is traditionally a measure of alcohol

craving, its wording has been successfully revised to measure general substance craving (Costello et al., 2020), as was implemented in the current study. The revised items referred to alcohol and/or drugs broadly rather than specific substances. The PACS in both its original and modified versions has demonstrated good psychometric properties including internal consistency reliability, convergent and discriminant validity, short-term test-retest reliability, and sensitivity to clinical change (Costello et al., 2020; Flannery et al., 1999). In the current study, Cronbach's alpha of the PACS was very good ($\alpha = .974$).

Trauma History Measures

Lifetime Trauma Exposure. The Trauma History Questionnaire (THQ; Green, 1996) is a widely used measure of lifetime exposure to 24 types of traumatic events. It can be administered as either an interview or, as in the current study, a self-report questionnaire. The THQ captures three broad categories of trauma thought to represent PTSD qualifying events: general disaster and trauma (e.g., military combat, car accidents; 14 subtypes), criminal victimization (e.g., mugging, home invasion; 4 subtypes), and physical and sexual assault (6 subtypes). Participants indicated whether they had ever experienced each trauma subtype (yes/no) and, if so, how many times they had experienced it and approximately how old they were the first (or only) time they experienced the particular subtype of trauma. In a systematic review of 60 studies, researchers found that the THQ had overall good test-retest reliability, predictive validity (e.g., of PTSD, depression, and personality disorder symptoms), and generalizability to clinical and non-clinical samples across continents and languages (Hooper et al., 2011).

Past-Month PTSD Symptoms. The PTSD Checklist for *DSM-5* (PCL-5; Weathers et al., 2013) measured PTSD symptom severity. Based on the *DSM-5* diagnostic criteria, the

PCL-5 contains 20 items that form 4 subscales representing the main PTSD symptom clusters (intrusion, avoidance, negative cognitions and mood, and arousal and reactivity). Respondents self-report how much they have been "bothered" during the past month by each PTSD symptom using a 5-point Likert-type scale (maximum score = 80). In the current study, participants who endorsed any trauma exposure on the THQ completed the PCL-5. Participants with no trauma exposure would have automatically received a PCL-5 score of 0, but this did not apply. The PCL-5 has demonstrated good psychometric properties including internal consistency, test-retest reliability, convergent and discriminant validity, and sensitivity to clinical change (C. A. Blevins et al., 2015; Wortmann et al., 2016). A cutoff score of 33 is considered an optimal estimate of PTSD diagnosis, balancing sensitivity and specificity to detect the diagnostic threshold (Bovin et al., 2016). However, the current study intended to utilize the PCL-5 primarily as a continuous measure of PTSD symptom severity. Cronbach's alpha of the PCL-5 in this study was very good ($\alpha = .957$).

Criminal History Measures

Lifetime Criminal Offenses. Participants completed a self-report measure of lifetime criminal behavior developed for this study based on the Federal Bureau of Investigation Uniform Crime Reporting (FBI UCR) data collection guidelines (FBI, 2000). The UCR questionnaire defined 24 subtypes of criminal offenses using wording and examples closely adapted from the FBI guidelines. These offenses included violent, property, financial, and substance-related crimes that generally apply in jurisdictions across the United States. The UCR guidelines distinguish between Part I offenses (9 subtypes) and Part II offenses (15 subtypes). Part I offenses are generally considered more serious in nature and include homicide, rape, aggravated assault, and forms of theft. Part II offenses are considered

less serious and include simple assault, driving under the influence, drug offenses, and small fraud. The UCR questionnaire asked participants whether they had ever committed each offense subtype (yes/no), *even if they were not caught*, and, if so, approximately how many times they had committed it and how old they were the first (or only) time they committed the particular offense. Although no psychometric findings are available for this study-developed questionnaire, decades of research have shown that self-report measures of criminal activity can reliably circumvent the biases and limitations of criminal records, at times revealing criminal histories that would otherwise go undetected due to a lack of official arrest, charge, or conviction (Piquero et al., 2014; Thornberry & Krohn, 2000).

Current Offense Severity. In addition, Bernalillo County criminal records, which are available to the public online, were examined to determine the current criminal charge for which participants were serving time in the CCP. The severity of the current charge was quantified using the Pennsylvania Offense Gravity Score (POGS). The POGS was developed in 1982 by the Pennsylvania Commission on Sentencing as part of a largescale effort to establish structured and objective sentencing guidelines (Kramer & Scirica, 1986). The POGS subcommittee considered the following factors in assigning each criminal offense a severity score: actual or potential physical injury to a victim, actual or potential harm to a victim or the community, statutory classification of the offense, culpability of the offender, and context of the offense. In the present study, participants' current criminal charge was assigned a severity score according to the seventh and most recent edition of the POGS (Pennsylvania Commission on Sentencing, 2018). This score falls along a 14-point scale, where 1 represents the least serious offenses (e.g., disorderly conduct, theft under $50) and 14 represents the most serious offenses (e.g., murder, rape of a child). If a study participant

had multiple current charges, the most serious charge was selected. Where differences between New Mexico and Pennsylvania statutes were evident, the PI used discretion in assigning the most fitting POGS rating.

World Assumptions Measure

The World Assumptions Questionnaire (WAQ; Kaler, 2009) measured the hypothesized mechanism of negative world assumptions. Based on assumptive world theory, the WAQ was developed as a psychometrically superior alternative to Janoff-Bulman's (1989) World Assumptions Scale (see Kaler et al., 2008). This self-report questionnaire does not explicitly tie world assumptions to trauma and is thus applicable to individuals with or without trauma histories. The WAQ has 22 items that form 4 subscales: (a) controllability of events (e.g., “I don’t feel in control of the events that happen to me”; 5 items); (b) comprehensibility and predictability of people (e.g., “People often behave in unpredictable ways”; 5 items); (c) trustworthiness and goodness of people (e.g., “Most people cannot be trusted”; 6 items); and (d) safety/vulnerability (e.g., “People fool themselves into feeling safe”; 6 items). Respondents rated each statement using a 6-point Likert-type scale ranging from 1 = “strongly agree” to 6 = “strongly disagree”; therefore, higher WAQ scores (maximum = 132) indicate more positive world assumptions. Based on a sample of undergraduate students, the WAQ showed promising evidence of internal consistency, test-retest reliability, and convergent validity (Kaler, 2009). A subsequent evaluation of the WAQ’s psychometric properties in undergraduate students found adequate internal consistency reliability, good convergent validity, and sensitivity to a traumatic event during the test-retest interval (Schuler & Boals, 2016).

In the current study, Cronbach’s alpha of the WAQ was less than adequate (α =

.620). At the subscale level, comprehensibility and predictability of people (α = .780) had adequate internal consistency reliability, whereas trustworthiness and goodness of people (α = .667) was less than adequate, and controllability of events (α = .304) and safety/vulnerability (α = .156) were very poor. The poor internal consistency reliability of the WAQ in the current sample will be discussed later.

Additional Baseline Measures

The Gambling Urge Scale (GUS; Raylu & Oei, 2004) is a 6-item self-report measure of current urges to gamble. Respondents rate their agreement with each statement on a 7-point Likert-type scale (maximum score = 42). The GUS was administered to conduct exploratory analyses of potential gambling problems among the study population, supported by funding from the Sandia Casino Responsible Gaming Scholarship. The GUS has previously demonstrated good internal consistency reliability and concurrent, predictive, and criterion validity (Raylu & Oei, 2004). In the current study, Cronbach's alpha of the GUS was very good (α = .986).

The Levenson Psychopathy Scale (LPS; Levenson et al., 1995) is a well-established self-report measure of psychopathic traits, including egocentricity, callousness, and antisocial behavior. It contains 26 statements about personal characteristics, habits, and opinions that respondents rate on a 5-point Likert-type scale (maximum score = 130). The LPS was included in the study assessment battery to test psychopathic traits as a hypothesized covariate. Average psychopathy levels were not expected to be high within the lower-risk, primarily non-violent CCP population. However, inmates with elevated psychopathic traits may have had unique histories and pathways to recidivism that would be appropriate to statistically control. Although the factor structure and internal consistency reliability of the

LPS have been debated, the total LPS score has demonstrated generally good convergent and discriminant validity (Sellbom, 2011). In the current study, Cronbach's alpha of the LPS was good ($\alpha = .845$).

Recidivism Outcome Measure

The internal CCP database provided information about official violations during the 3 months post-baseline. Any CCP violation within the follow-up period resulted in a "yes" code for the recidivism outcome variable. When affirmative, the date of the violation was recorded, in addition to the type of violation: (a) positive drug test, (b) positive alcohol test, (c) arrest on new charges, (d) failure to report to staff, or (e) other program violation. Alternatively, if a participant did not incur a violation, their data captured whether they successfully discharged from the program (and, if so, their date of release) or whether they remained in the CCP at the time of follow-up.

Procedure

Ethical Guidelines

All study procedures were approved by the University of New Mexico main campus Institutional Review Board (UNM IRB). Although CCP inmates live in the community, because they are under constant correctional supervision, they were considered prisoners from a research ethics standpoint. This study therefore was subject to the Health and Human Services Title 45 Code of Federal Regulation Part 46 Subpart C regulations on the conduct of research with prisoners, including the following:

(a) The research aims were appropriate in that they concerned "the possible causes, effects, and processes of incarceration, and of criminal behavior" in addition to "conditions particularly affecting prisoners as a class (for example…alcoholism,

drug addiction, and sexual assaults)."

(b) The UNM IRB included a prisoner or prisoner representative in the review of the study application, and the majority of the IRB had no association with the CCP.

(c) The financial incentives for participation, when compared to inmates' normal opportunities for earnings, were not of such a magnitude that inmates were impaired from making an informed decision to participate in the study; because CCP inmates are allowed to work, it was fair to compensate them at a standard community rate of $20/hour.

(d) The risks involved in the research were commensurate with risks that would be accepted by non-prisoner volunteers.

(e) Procedures for the selection of participants were fair to all CCP inmates and immune from arbitrary intervention by authorities.

(f) Study information was presented in language that was understandable to the CCP population; the informed consent form was constructed at an eighth-grade reading level.

(g) CCP administrators provided adequate assurance that inmates' participation in the study would not be considered during legal proceedings, and each inmate was clearly informed that participation in the study would have no effect on legal status.

(h) The study obtained a Federal Certificate of Confidentiality from the National Institutes of Health, which protected the data against forced disclosure by subpoena or other legal intervention.

Recruitment and Pre-Screening

Recruitment for the study began in July 2019. CCP inmates were recruited via a flyer

that was posted throughout the CCP office waiting room. In addition, the CCP Social Services Coordinator distributed the study flyer to newly admitted inmates during their intake processing. The flyer contained basic information about the study eligibility criteria, parameters of participation, financial incentive, and contact information. Interested inmates were directed to contact a study e-mail address and/or Google Voice phone number with call and text capabilities, which were closely monitored by the PI.

As mentioned, the initial recruitment strategy had limited success, and was revised in February 2020. With permission from the CCP Captain and UNM IRB, the PI began visiting the CCP office approximately 3 days per week during peak program hours in which groups of inmates were present for their mandatory office visits. The researcher announced the study opportunity and consulted with inmates who expressed interest in participating. This revised recruitment approach generated significantly more visibility and interest in the study.

During the initial contact (phone or in-person), inmates were pre-screened for their date of admission into the CCP. Per the study eligibility criteria, those who had entered the CCP more than 1 month prior were informed that they were not eligible to participate, and no additional data or identifying information were gathered from them. This procedure was intended to reduce burden and to maximize confidentiality of inmates who were clearly ineligible for the research. Although study records indicate that 6 inmates were excluded from the study on the basis of CCP enrollment date, the actual number was much higher when accounting for informal pre-screening that occurred during conversations between inmates and staff. In late February 2020, given recruitment difficulties and findings that many interested inmates were being pre-screened out of the study, the eligibility criteria were broadened with IRB approval. With the revised eligibility criteria, CCP inmates could now

participate in the research regardless of when they were admitted into the CCP. However, the COVID-19 pandemic followed shortly after, and only one inmate was recruited into the study under these revised criteria.

Screening Interview

Inmates who passed the pre-screening phase were scheduled for an in-person screening interview. They were provided the option to hold this interview in a private room at either the CCP office or the UNM Center on Alcohol, Substance Use, and Addictions (CASAA); most inmates opted for the familiar location of the CCP office. Inmates were informed in advance that they must obtain permission from CCP staff to attend this appointment (as they were required to do for all personal appointments). Four pre-screened inmates were unable to be scheduled or re-scheduled for the screening interview.

The screening interview lasted approximately 20 minutes and consisted of the demographics form, *DSM-5* psychotic disorder screening items, and cognitive functioning test (MMSE). As described earlier, inmates were excluded if they rated their English speaking ability as limited ($n = 0$), endorsed any of the five *DSM-5* Diagnostic Interview (Nussbaum, 2013) items in a manner indicative of active psychosis ($n = 0$), or scored < 22 on the MMSE (Folstein et al., 1975; $n = 1$). Inmates who screened out of the study were informed of their ineligibility, and no identifying information was collected from them.

Informed Consent

Inmates who were deemed eligible for the study underwent informed consent immediately following the screening interview. They were provided a form, read aloud by the researcher, that detailed the following: (a) participation was voluntary; (b) participation would in no way, good or bad, affect inmates' status in the CCP or other legal matters; (c)

participation would entail answering questionnaires for approximately 2 hours; (d) the researcher also would be accessing participants' CCP records to document their program outcomes 3 months later; (e) questions would ask about experiences with trauma, substance use, and crime, which might be upsetting or uncomfortable; if at any time participants did not feel comfortable answering a question, they could decline to answer or terminate their participation; (f) participants would be reimbursed for their time and effort at a rate of $20/hour with a $40 Walmart gift card (or a gift card for a lower amount if they terminated participation early); (g) all participant data, including information about substance use and criminal activity, would be kept confidential and was protected against subpoena by the Federal Certificate of Confidentiality; the only cases in which research staff would break confidentiality were if participants expressed intent to harm themselves or others or reported abuse or neglect of children or elders; and (h) CCP staff would receive only aggregate results of the study and would not have access to individual participant data; however, given that CCP staff track the whereabouts of inmates at all times, they would know who chose to participate in the study.

All inmates who underwent informed consent (n = 14) agreed to participate in the study. The bottom of the informed consent form contained a 4-item true/false consent quiz that inmates were instructed to read aloud and answer. The purpose of this was twofold: to further gauge participants' reading level (beyond their self-report) and to ensure they understood the parameters of participation, including basic elements of confidentiality, sensitivity of the data collected, financial compensation, and separation between the research and CCP/legal operations. The researcher further clarified study procedures to any participant who answered a quiz item incorrectly. After completing informed consent, participants

provided their full name and date of birth. This identifying information served the purpose of facilitating follow-up data collection from the CCP database.

Baseline Data Collection

Baseline data collection immediately followed informed consent. All participants demonstrated an adequate reading level and therefore completed the assessment battery in a written format. The assessment battery contained the following sequence of questionnaires (described above): the NM ASSIST, PACS, THQ, PCL-5, WAQ, UCR questionnaire, LPS, and GUS. These questionnaires were formatted in REDCap (Harris et al., 2009), a secure online data collection platform that stored study data on the UNM CASAA server. Utilizing this format reduced the likelihood of missing data (blank fields were prompted for responses) and eliminated the need for researcher data entry. Most participants completed the assessment battery in 1 hour or less, but were reimbursed for 2 hours of their time with a $40 Walmart gift card as promised in the informed consent form.

Follow-Up Data Collection

Follow-up recidivism data were collected 3-months post-baseline. Because the PI did not have direct access to the internal CCP database, the CCP Social Services Coordinator provided the requested data either in person or over the phone, and the PI inputted the data in REDCap. Follow-up data included whether the participant incurred a CCP violation during the 3 months following their baseline appointment, and, if so, the date and type of violation (drugs, alcohol, failure to report to staff, arrest on new charges, or other). If the participant did not incur any violations during the follow-up period, the researcher documented whether they had successfully released from the program (and, if so, their date of release) or whether they remained in the CCP at the time of follow-up.

Proposed Data Analyses

The following analytic plan reflects the analyses that were proposed for a much larger sample size than was actually obtained. These analyses were not feasible given the low statistical power of the final sample, but are presented in line with the study hypotheses as a blueprint for future research.

Latent Variable Modeling. Latent variable modeling would be conducted in Mplus version 8 (Muthén & Muthén, 2017). Unstandardized regression coefficients (*B*) would be examined for statistical significance and reported alongside standardized coefficients (β). Model fit would be evaluated based on the chi-square (χ^2), Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993), Comparative Fit Index (CFI; Bentler, 1990), and Weighted Root Mean Square Residual (WRMR; Yu, 2002). As recommended by these authors, good model fit would be indicated by a non-significant χ^2 ($p \geq .05$), RMSEA < .05, CFI > .95, and WRMR < 1.00. Residual correlations would be examined for an acceptable magnitude of < 0.10 (Kline, 2011).

Aim 1. *To examine trauma, substance use, and crime as a "risk triad" predicting recidivism.* For Hypothesis 1, confirmatory factor analysis (CFA) would test the "risk triad" latent variable for measurement model fit and the factor loadings of each indicator. The "risk triad" would consist of six baseline indicators: (a) Average substance involvement score on the NM ASSIST (lifetime substance involvement), (b) PACS score (past-week substance cravings), (c) Total number of events reported on the THQ (lifetime trauma exposure), (d) PCL-5 score (past-month PTSD symptoms), (e) Total number of offenses reported on the UCR questionnaire (lifetime criminal offenses), and (f) POGS rating of the index offense (current offense severity). The composite "risk triad" latent variable would be regressed on

the eight covariates of age, race/ethnicity, education level, income, employment status, marital/relationship status, literacy, and psychopathic traits (LPS score).

Based on the initial CFA results, the measurement model would be respecified as appropriate. For example, it may have been necessary to model covariance between indicators with high collinearity (e.g., the lifetime and current substance use variables). In addition, it was considered that the indicators might not group together as a single latent variable as hypothesized. Poor model fit of the initial CFA would trigger exploratory latent variable modeling techniques, following the guidance of Witkiewitz et al. (2013), to obtain good model fit among the "risk triad" indicators for the remaining analyses.

To test Hypothesis 2, the binary recidivism outcome variable would be regressed on the resulting "risk triad" latent variable model. Recidivism also would be regressed on the eight demographic covariates (described above), participants' baseline court status (pre-trial versus sentenced), number of days in the CCP at baseline, and number of days in the CCP between baseline and follow-up, to adjust for inmates who were released within the follow-up period and had a shorter window for recidivism.

Aim 2. *To test world assumptions as a mediator of the association between the "risk triad" and recidivism.* The mediation analysis for Hypothesis 3 would build on the models from Hypotheses 1 and 2 by adding total WAQ score (world assumptions) as a mediator in the association between the "risk triad" and recidivism. WAQ score would be regressed on the eight above-mentioned covariates and also gender. A significant indirect effect in Mplus would indicate mediation by world assumptions. In addition, the RMediation package (Tofighi & MacKinnon, 2011) would be used to construct a 95% confidence interval for the indirect effect.

Aim 3. *To test gender as a moderator of the association between the "risk triad" and recidivism.* The moderation analysis for Hypothesis 4 would build on the models from Hypotheses 1 and 2 by adding an interaction term between the "risk triad" and gender as a predictor of recidivism. A significant interaction effect would indicate moderation by gender (i.e., whether the association between the "risk triad" and recidivism was stronger for women than men). As a final analysis of the full conceptual model, illustrated in Figure 1, the models from Hypotheses 1-4 would be combined and examined for overall model fit.

Actual Data Analyses

The very small sample size precluded the ability to conduct the proposed statistical analyses. The analytic aims of the study therefore shifted to descriptive in nature. Descriptive statistics included frequencies, means, standard deviations, ranges, and skewness and kurtosis values as calculated in SPSS Statistics 27. No data were missing, and extreme outliers were removed in limited cases. In addition to the full dataset descriptive statistics, select variables were examined by gender (male versus female) and trauma exposure level (low, medium, and high) to elucidate potential group differences that were especially relevant to the conceptual underpinnings of the study. The various summary scores that were generated and accompanying analyses are presented with the results below.

Supplementary Aim Method

Sample

Project Injectable Pharmacotherapy for Opioid Use Disorders (IPOD) was a randomized clinical trial of injectable extended-release naltrexone for adult male and female inmates incarcerated in the Bernalillo County Metropolitan Detention Center (MDC). Eligibility criteria included *DSM-5* diagnosis of opioid use disorder and expected release

from jail within 1 year post-baseline. There were 151 inmates randomized into the study and 16 participants who did not complete follow-up (because they were transferred directly from the MDC to long-term incarceration in prison), resulting in a final sample size of 135. Participants were predominantly male (73%), Hispanic/Latino (64%), and homeless at the time of incarceration (59%). The average age of the sample was 32.76 (*SD* = 9.37) years old. Participants were randomized into one of three conditions: enhanced treatment-as-usual (consisting of information about opioid overdose and a referral list of community providers), injectable naltrexone alone, or injectable naltrexone with the addition of a patient navigator to facilitate access to services after release from jail. The two primary aims of the study were to test the effectiveness of injectable naltrexone and patient navigation, both of which were limited by low treatment adherence rates. Participants across the three conditions did not significantly differ with regard to opioid use outcomes or rates of re-arrest/recidivism. More detailed descriptions of the IPOD study protocol (Farabee et al., 2016), sample characteristics, and results (Farabee et al., 2020) are available in the published literature.

Variables

The current secondary analysis drew on the available IPOD data about inmates' histories of trauma, substance use, and criminal offending as assessed at the study baseline. The Addiction Severity Index-Lite (ASI; Cacciola et al., 2007), a well-established structured clinical interview, included two items asking respondents whether anyone had ever abused them physically ("caused physical harm") or sexually ("forced sexual advances/acts"). Responses to these two items were used to group participants according to lifetime history of interpersonal trauma (yes/no). The ASI also inquired about respondents' histories of using 11 substance categories (alcohol, heroin, methadone, other opioids, barbiturates, other sedatives,

cocaine, amphetamines, cannabis, hallucinogens, and inhalants). Lifetime use was captured by the total number of years participants had used each substance; the highest value reported across the 11 substance categories was selected for further analysis. For criminal history, the ASI inquired about the number of times respondents had been arrested and charged for 17 types of offenses representing a wide range of criminal severity; responses to these 17 items were summed for the current analysis. In addition to these baseline ASI "risk triad" variables, the IPOD recidivism outcome was examined. Recidivism in IPOD referred to whether participants were re-arrested, based on official court data, within 12 months following the study baseline.

Analyses

The IPOD analyses mirrored the primary dissertation analyses (of the $n = 14$ sample) as closely as possible, with the added inclusion of significance testing given the larger IPOD sample size. Independent samples *t*-tests were conducted in SPSS to analyze differences by trauma group (yes versus no history of lifetime physical and/or sexual abuse) and gender (male versus female) with regard to lifetime years of substance use, total criminal offenses, and 12-month recidivism rates. Chi-square tests of independence were used to confirm the *t*-test findings for binary dependent variables. Furthermore, a series of logistic regression analyses were conducted in Mplus 8 (Muthén & Muthén, 2017) to test gender, the "risk triad" variables, and their two-way interactions as potential longitudinal predictors of recidivism. The regression analyses are described in further detail with their results below.

Figure 2 *Timeline of Study Development and Implementation*

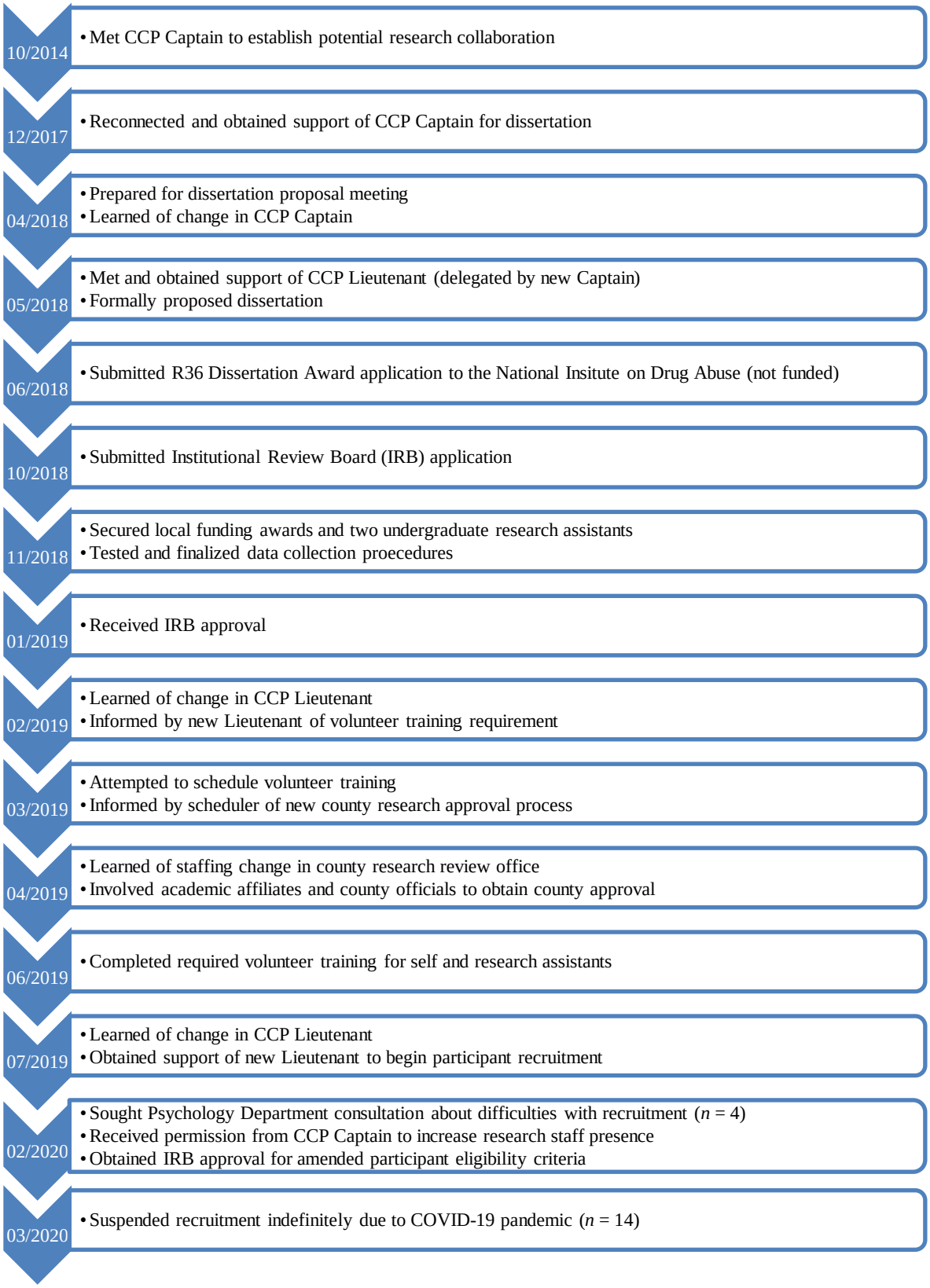


Table 1

Demographic Characteristics of Participants at Baseline

Characteristic	% (*n*)	Mean	*SD*	Range
Gender				
Male	71.4% (10)			
Female	28.6% (4)			
Age		36.86	7.41	26-48
Race				
Hispanic/Latino	50.0% (7)			
Native American	21.4% (3)			
White	21.4% (3)			
Multiracial	7.1% (1)			
Relationship Status				
Single	42.9% (6)			
Committed	14.3% (2)			
Cohabitating	21.5% (3)			
Married	14.3% (2)			
Separated	7.1% (1)			
Educational Degree				
None	7.1% (1)			
Trade Certificate	7.1% (1)			
GED	14.3% (2)			
High School Diploma	21.4% (3)			
Associate's Degree	28.6% (4)			
Bachelor's Degree	21.4% (3)			
Employment Status				
Unemployed	42.9% (6)			
Part-Time	28.6% (4)			
Full-Time	28.6% (4)			
Household Income		$21,236	$33,858	$0-125,000
Criminal Charge Level				
Misdemeanor	50.0% (7)			
Felony	50.0% (7)			
Court Status				
Pre-Trial	28.6% (4)			
Sentenced	71.4% (10)			
Days in CCP		18.50	14.71	< 1-53
English Speaking Ability				
Very Good	92.9% (13)			
Good	7.1% (1)			
English Reading Ability				
Very Good	85.7% (12)			
Good	14.3% (2)			

Table 2

Study Measures

Purpose	Measure	Format	Time (min.)	Scheduled at:		
				Screening	Baseline	Follow-Up
Eligibility	*DSM-5* psychotic disorder screening items	Interview	5	X		
	Mini-Mental State Examination (MMSE)	Interview	10	X		
Descriptives and covariates	Demographics form	Interview	10	X		
	Consent quiz (literacy measure)	Interview	5		X	
	Gambling Urge Scale (GUS)	Self-report	5		X	
	Levenson Psychopathy Scale (LPS)	Self-report	10		X	
Hypothesis testing	NIDA-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NM ASSIST)	Self-report	25		X	
	Penn Alcohol Craving Scale (PACS)	Self-report	5		X	
	Trauma History Questionnaire (THQ)	Self-report	20		X	
	PTSD Checklist for *DSM-5* (PCL-5)	Self-report	10		X	
	World Assumptions Questionnaire (WAQ)	Self-report	10		X	
	Uniform Crime Reporting (UCR) questionnaire	Self-report	25		X	
	Pennsylvania Offense Gravity Score (POGS) rating	Record			X	
	CCP recidivism outcome	Record				X

CHAPTER 3

RESULTS

Full Sample Descriptive Statistics

Trauma History

Table 3 presents the full sample descriptive statistics for trauma history. Using the THQ, separate scores were generated for the number of subtypes of trauma endorsed (of a possible 24), total number of separate traumatic events, number of traumatic events by category (general/disaster, criminal victimization, and physical/sexual assault), and age of onset of trauma (the youngest age reported for any item). Table 3 also includes the PCL-5 score of past-month PTSD symptom severity.

As shown, all participants reported experiencing 1-14 subtypes of trauma (M = 8.14, SD = 3.88). Six participants reported over 25 total traumatic events; one participant was an extreme outlier who reported over 1,000 total events. With this outlier removed, participants reported 2-73 unique traumatic events (M = 24.92, SD = 20.68). General/disaster trauma was endorsed more frequently than experiences of criminal victimization or physical/sexual assault. The age of onset of trauma ranged from 1-31 years old (M = 11.93, SD = 8.30). The mean PCL-5 score was 24.14 (SD = 18.86) with a range of 0-57 (of a maximum possible score of 80). Although the PCL-5 was not intended to diagnose PTSD in the current study, 5 participants (35.71%) scored in the range of probable PTSD diagnosis (score ≥ 33) according to measure guidelines (Bovin et al., 2016).

Substance Use History

Substance use descriptive statistics are displayed in Table 3, including the 10 lifetime substance involvement scores (alcohol, cannabis, cocaine, prescription stimulants,

methamphetamine, inhalants, sedatives or sleeping pills, hallucinogens, street opioids, and prescription opioids) from the NM ASSIST. Accompanying each risk score is the reported age of onset of use. The following scores were calculated across the 10 NM ASSIST substance categories: average substance risk score, average age of onset of use, highest substance risk score, and youngest age of onset of use. In addition, Table 3 includes participants' PACS score of past-week general substance craving.

As shown, the average substance involvement score across participants and substances was in the moderate range. There was considerable variation among substances, with participants endorsing the most problems related to alcohol, followed by cannabis and cocaine. The remaining substance risk scores were highly positively skewed (skewness > 1.00). Average substance involvement was very low for prescription stimulants and inhalants in particular. Closer examination of the data showed that 11 participants (78.57%) scored in the high-risk range for at least one substance category, with 4 reaching the maximum NM ASSIST score of 39. The remaining 3 participants (21.43%) scored in the moderate risk range for at least one substance. Thus, on average, participants' highest substance involvement score across the 10 substance categories was in the high-risk range. Across participants and substances, the average age of onset of substance use was 19.84 years old. However, all participants reported initiating use of alcohol and/or marijuana between the ages of 10 and 19 (youngest age of onset of use: M = 14.36, SD = 2.37). With regard to past-week general substance craving, the average PACS score in the sample was 8.21 (SD = 9.54), with scores ranging from 0-30 (the maximum score).

Criminal History

Table 3 also provides descriptive statistics for criminal history. Summary scores

were extracted from the UCR questionnaire for number of subtypes of crime endorsed (of a possible 24), total number of criminal offenses, number of offenses by category (Part I and Part II offenses), and age of onset of criminal behavior (the youngest age reported for any item). In addition, the current charge for which participants were in CCP custody is quantified in Table 3 based on the POGS rating of offense severity.

Participants reported committing 0-11 different subtypes of criminal offenses (M = 5.43, SD = 3.11; one participant denied a history of all criminal behavior on the UCR questionnaire). Part II offenses were endorsed much more frequently than Part I offenses, with 3 participants reporting over 200 separate incidents of Part II offenses. One participant was an extreme outlier who disclosed over 1,000 criminal offenses; removing this outlier still resulted in a positively skewed and kurtotic total number of criminal offenses within the sample (M = 60.62, SD = 77.68). Participants reported initiating criminal behavior between the ages of 12-26 (M = 16.77, SD = 3.54). With regard to the index offense, the majority of participants (8, 57.14%) were serving time in the CCP for driving while intoxicated (DWI). Only 1 participant (7.14%) was charged with a violent index offense (domestic assault). The 5 remaining participants were charged with the following index offenses (1 or 7.14% each): fraud, dealing stolen credit cards, drug possession, damage to property, and eluding police. The average POGS rating (of a maximum possible score of 14) was 4.36, representing relatively mild severity of the current charge.

World Assumptions

The WAQ total score and four subscale scores are included in Table 3. Participants endorsed fairly negative world assumptions, with an average total score of 66.43 out of a maximum possible range of 22-132 (observed range of 48-82), where higher scores indicate

more positive world assumptions. There was relatively little variability among participants' WAQ scores, with all five scales showing acceptable skewness and kurtosis values.

Additional Baseline Measures

Also included in Table 3 are the hypothesized covariates of gambling urges and psychopathic traits. The average GUS score indicated fairly low gambling urges, with 9 participants endorsing the lowest possible GUS score of 6. The average LPS score indicated moderate psychopathic traits among the sample, with the highest participant scoring 96 out of a possible maximum score of 130.

Recidivism Outcomes

The 3-month follow-up outcomes are displayed at the bottom of Table 3. Five (35.71%) of the 14 inmates incurred a CCP violation between baseline and follow-up. Two (40.00%) of these participants had a positive drug test violation, while 1 (20.00%) had a positive alcohol breathalyzer test, 1 (20.00%) failed to report to staff, and 1 (20.00%) incurred another type of violation (possession of drug paraphernalia). The timing of violations varied substantially, occurring from 3-76 (M = 34.80, SD = 33.79) days following the study baseline and 3-100 (M = 46.00, SD = 44.16) days following the date of CCP admission. Of the 9 inmates who did not incur a violation within the follow-up period, 5 (44.44%) were released from the CCP within an average of 57.40 days after baseline and 82.00 days after CCP admission. Four (28.57%) of the 14 participants remained in the CCP (i.e., had neither violated nor released) at the time of follow-up.

Group Comparisons

Participants were grouped by trauma history (low, medium, and high exposure) and gender (male versus female). Based on dataset variability and conceptual relevance, the

following variables were selected for group comparisons: (a) NM ASSIST average substance involvement score (across 10 substances), (b) NM ASSIST average age of onset of substance use (across 10 substances), (c) NM ASSIST highest substance involvement score (across 10 substances), (d) NM ASSIST youngest age of onset of substance use (across 10 substances), (e) PACS score (craving), (f) THQ total subtypes of trauma, (g) THQ total traumatic events, (h) THQ age of onset of trauma, (i) PCL-5 score (PTSD symptoms), (j) UCR total subtypes of crime, (k) UCR total criminal offenses, (l) UCR age of onset of crime, (m) POGS rating (offense severity), (n) WAQ total world assumptions score, (o) WAQ comprehensibility and predictability of people (CPP) subscore, (p) WAQ trustworthiness and goodness of people (TGP) subscore, (q) WAQ controllability of events (CE) subscore, (r) WAQ safety/vulnerability (SV) subscore, and (s) CCP recidivism outcome (violation, release, or continued program enrollment). Group means and standard deviations were compared, but their differences were not tested for statistical significance given the limitations of computing inferential statistics with a very small sample.

Trauma Exposure Groups

Participants were grouped by trauma history according to the number of subtypes of trauma (of a possible 24) they endorsed on the THQ. This variable was selected because it is the most common THQ summary score in the literature (Hooper et al., 2011) and appeared less susceptible to over- or under-reporting than the total number of traumatic events. Group membership was determined based on the distribution of the sample data and a goal of establishing three roughly equal sized groups to compare. Participants in the low trauma group (n = 4) endorsed 1-6 subtypes of trauma (M = 3.50, SD = 2.38), whereas those in the medium trauma (n = 6) and high trauma (n = 4) groups endorsed 7-9 (M = 8.17, SD = 0.98)

and 12-14 (*M* = 12.75, *SD* = 0.96) subtypes of trauma, respectively. Men and women were spread in roughly equal proportions throughout the three groups.

Table 4 displays the means and standard deviations of the 19 select variables stratified by trauma group. As shown, the three groups appeared to differ in the expected direction on all trauma-related variables. Notably, higher trauma exposure corresponded with a younger age of onset of trauma and a higher PCL-5 score of past-month PTSD symptoms. Individuals in the high trauma group, on average, met the PCL-5 threshold for probable PTSD diagnosis (*M* = 33.25), although there was high variation (*SD* = 22.98). For substance use, an interesting pattern emerged in which the medium trauma group endorsed higher lifetime substance involvement (e.g., higher NM ASSIST average risk score) than the low trauma and high trauma groups. At the same time, the medium trauma group reported much lower substance craving on the PACS than the low trauma and high trauma groups. A similar pattern began to emerge indicating possible higher criminality among the medium trauma group, but large variation within each group limited the findings. Results for world assumptions were as expected in that higher trauma exposure appeared to correspond with more negative world assumptions (lower scores) on the WAQ. There were no obvious differences among the trauma groups in recidivism outcomes. Figure 3 displays scatter plots for five key variables (NM ASSIST average substance risk score, PACS score, PCL-5 score, total criminal offenses, and WAQ total score) exemplifying the considerable variability in the data both between and within the three trauma groups.

Gender Differences

Table 5 presents means and standard deviations of the 19 select variables stratified by gender (10 men and 4 women). A possible pattern emerged indicating higher lifetime

substance involvement among men (e.g., higher NM ASSIST average risk score) but a later age of onset of substance use and weaker substance craving among men than women. Likewise, men reported more traumatic events than women (even with the extreme outlier removed) but a later age of onset of trauma and lower PTSD symptomatology compared to women. Criminality appeared to be higher among men, several of whom reported hundreds to thousands of separate criminal offenses, and was initiated at an earlier age compared to women. World assumptions were slightly more positive among women, which appeared to be driven by a 6-point gender difference on the WAQ TGP subscale in particular. There were no obvious gender differences in recidivism outcomes. Figure 4 displays scatter plots for five key variables (NM ASSIST average substance risk score, PACS score, PCL-5 score, total criminal offenses, and WAQ total score) exemplifying the considerable variability in the data both between and within the gender groups.

Supplementary Aim Results

Table 6 displays the means and standard deviations of the IPOD trauma, substance use, criminal history, and recidivism variables (described above). Statistically significant group differences are highlighted in bold. As shown, the overall rates of trauma and recidivism in the sample were 34% and 41%, respectively. The recidivism outcome significantly differed by trauma group, but in the unexpected direction—individuals with a history of interpersonal trauma (n = 46) were less likely to be re-arrested than those without a trauma history (n = 89) at respective rates of 28% versus 48%: t = -2.34, p = .021. There were no other significant differences by trauma group. For gender differences, women (n = 37) were significantly more likely than men (n = 98) to endorse a history of interpersonal trauma at respective rates of 76% versus 18%: t = -7.39, p < .001. On average, men reported

6 more lifetime criminal offenses than women, which also was statistically significant: t = 2.65, p = .009. There were no significant gender differences in substance use or recidivism.

A series of regression analyses predicting recidivism were conducted to further probe the IPOD data, particularly in light of the unexpected trauma group findings and the possibility that gender may have moderated the inverse association between trauma and recidivism. The following variables were entered into logistic regression analyses predicting recidivism: gender, trauma history, substance use years, total criminal offenses, gender × trauma interaction, gender × substance use interaction, gender × crime interaction, trauma × substance use interaction, trauma × crime interaction, and substance use × crime interaction. Binary predictor variables were dummy-coded and continuous predictors were mean-centered. Each main effect was first entered alone into a separate regression equation. For the moderation analyses, both main effects were analyzed together before the interaction variable was entered as the final step.

Table 7 displays the results of the individual main effect analyses and the interaction analyses. Consistent with the *t*-test results, when analyzed alone trauma history emerged as the only significant predictor of recidivism, again in the unexpected direction: *B (SE)* = -0.864 (0.390), β = .220, p = .027. However, with gender entered into the regression equation, trauma was no longer statistically significant: *B (SE)* = -0.833 (0.460), β = -.212, p = .070 (gender remained non-significant; results of this step not included in table). As shown, the gender × trauma interaction was not statistically significant nor were any of the other interaction effects.

As a final probing of the gender × trauma × recidivism relationship, a descriptive 2 × 2 × 2 crosstabulation analysis was performed in SPSS. As displayed in Table 8, of the 33

IPOD participants with a history of trauma who did not recidivate, 20 (60.6%) were women. Moreover, of the 43 participants without a history of trauma who did recidivate, 39 (90.7%) were men (see Table 8). These results provided further support for the influence of gender on the observed inverse relationship between trauma history and recidivism.

Table 3

Full Sample Descriptive Statistics (n = 14)

Measure/Variable	Mean	*SD*	Range	Skewness	Kurtosis
Trauma History: *THQ*					
Trauma Subtypes (of 24)	8.14	3.88	1-14	-0.32	-0.43
General Type Events	23.93	44.20	1-171	3.25	11.20
Criminal Type Events	12.21	26.73	0-104	3.59	13.20
Assaultive Type Events	78.07	265.49	0-1000	3.74	13.96
Total Traumatic Events	114.21	334.69	2-1275	3.72	13.88
Outlier Removed[a]	24.92	20.68	2-73	1.41	1.66
Age of Onset of Trauma	11.93	8.30	1-31	0.88	0.51
PCL-5 Score (PTSD Symptoms)	24.14	18.86	0-57	0.41	-0.89
Substance Use History: *NM ASSIST*					
Alcohol Risk Score	25.36	14.62	0-39	-0.74	-0.94
Age of Onset of Use	15.07	9.54	10-19	-0.24	0.36
Cannabis Risk Score	14.50	12.35	0-39	0.36	-0.73
Age of Onset of Use	15.00	2.46	10-20	-0.14	-0.65
Cocaine Risk Score	11.36	12.33	0-39	0.90	0.19
Age of Onset of Use	20.92	2.94	14-30	0.58	-1.04
Prescription Stimulants Risk Score	0.57	1.16	0-3	1.71	1.26
Age of Onset of Use	23.67	5.27	15-38	1.62	[b]
Methamphetamine Risk Score	8.14	10.80	0-32	1.34	0.46
Age of Onset of Use	27.30	12.50	15-47	1.10	0.51
Inhalants Risk Score	0.21	0.80	0-3	3.74	14.00
Age of Onset of Use	16.50	10.05	15-18	[b]	[b]
Sedatives Risk Score	3.71	9.39	0-35	3.28	11.27
Age of Onset of Use	22.20	2.12	15-30	0.34	-3.07
Hallucinogens Risk Score	3.71	6.06	0-21	2.10	4.69
Age of Onset of Use	18.13	7.36	10-29	0.83	0.34
Street Opioids Risk Score	9.29	13.81	0-39	1.22	.038
Age of Onset of Use	27.57	6.08	19-42	0.83	-1.13
Prescription Opioids Risk Score	4.21	9.01	0-33	2.91	9.05
Age of Onset of Use	18.50	9.43	15-23	0.53	-0.85
NM ASSIST Across 10 Substances:					
Average Risk Score	8.11	4.25	3.5-14.9	0.58	-1.35
Average Age of Onset of Use	19.84	3.88	14.4-28.9	0.89	0.88

Measure/Variable (Cont.)	Mean	*SD*	Range	Skewness	Kurtosis
Highest Risk Score	32.42	8.22	12-39	-1.45	1.63
Youngest Age of Onset of Use	14.36	2.37	10-19	-0.14	0.09
PACS Score (Craving)	8.21	9.54	0-30	1.45	1.25
Criminal History: *UCR*					
Crime Subtypes (of 24)	5.43	3.11	0-11	-0.06	-0.67
Part I Type Offenses	10.21	26.23	0-100	3.56	12.99
Part II Type Offenses	118.80	268.03	0-1017	3.33	11.62
Total Criminal Offenses	129.00	266.53	0-1018	3.27	11.34
Outlier Removed[a]	60.62	77.68	0-219	1.56	1.04
Age of Onset of Crime	16.77	3.54	12-26	1.29	3.30
POGS Rating (Charge Severity)	4.36	1.22	2-6	-1.11	0.29
World Assumptions					
Total WAQ Score	66.43	10.12	48-82	-.16	-.98
WAQ CPP Subscore	12.93	4.92	5-24	.33	.84
WAQ TGP Subscore	18.21	4.96	11-27	.34	-.72
WAQ CE Subscore	21.36	4.16	13-27	-.41	-.51
WAQ SV Subscore	13.93	3.15	8-19	-.49	-.42
Other Baseline Measures					
GUS Score (Gambling Urges)	11.36	8.80	6-34	1.67	2.25
LPS Score (Psychopathic Traits)	71.21	13.30	45-96	-0.10	0.18
3-Month Recidivism Outcomes					
Violation?			35.71% (5) Yes		
Days Study Baseline to Violation	34.80	33.79	3-76	1.65	2.75
Days CCP Admission to Violation	46.00	44.16	3-100	1.71	3.24
Release?			35.71% (5) Yes		
Days Study Baseline to Release	57.40	34.76	13-91	-0.55	-2.54
Days CCP Admission to Release	82.00	20.06	48-99	-1.70	3.06
Still in Program?			28.57% (4) Yes		
Days Since CCP Admission	111.50	12.124	96-123	-0.68	-1.39

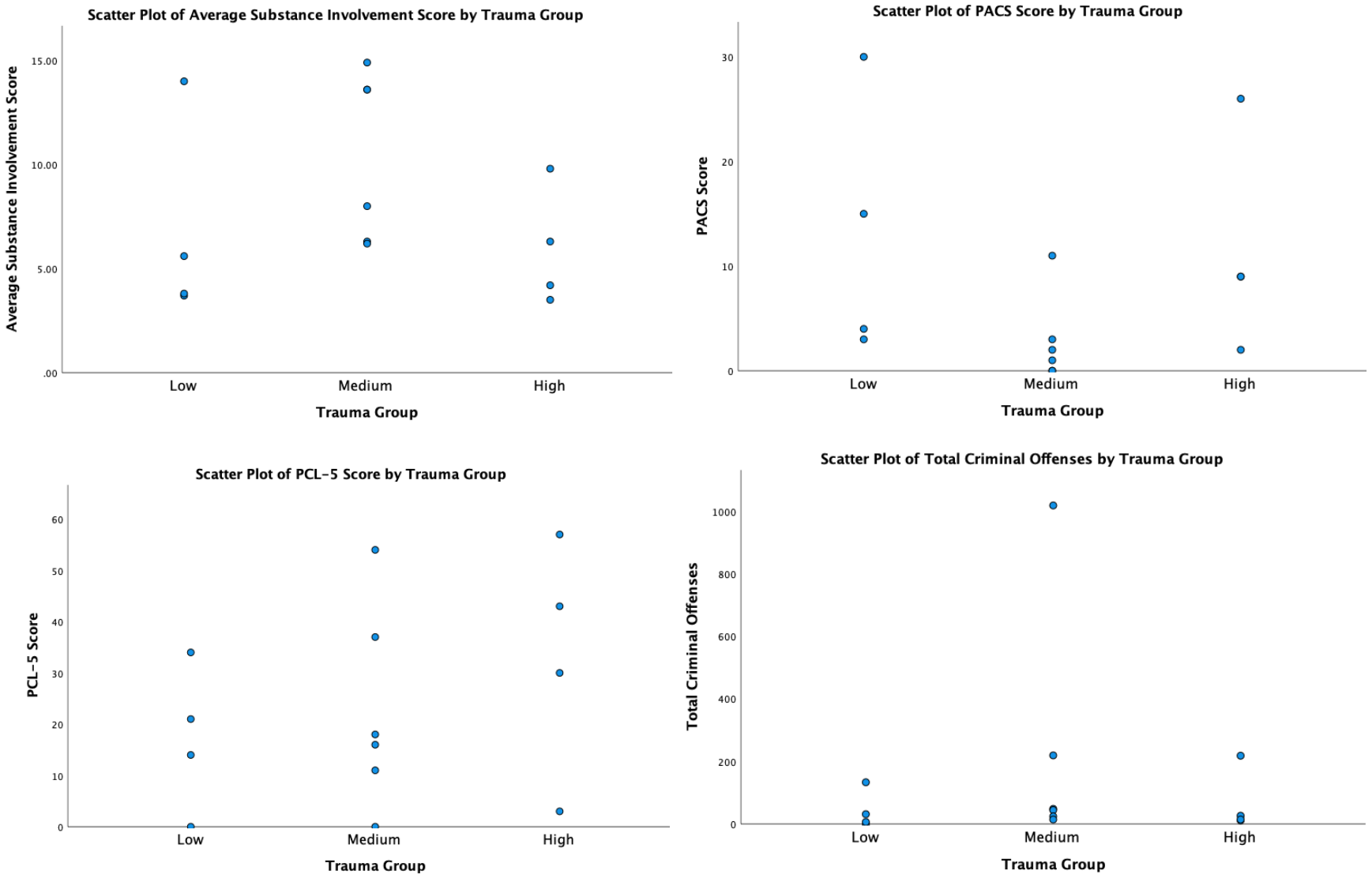
Note. [a]Participant removed for providing a value of over 1,000. [b]Insufficient *n* to calculate statistic.

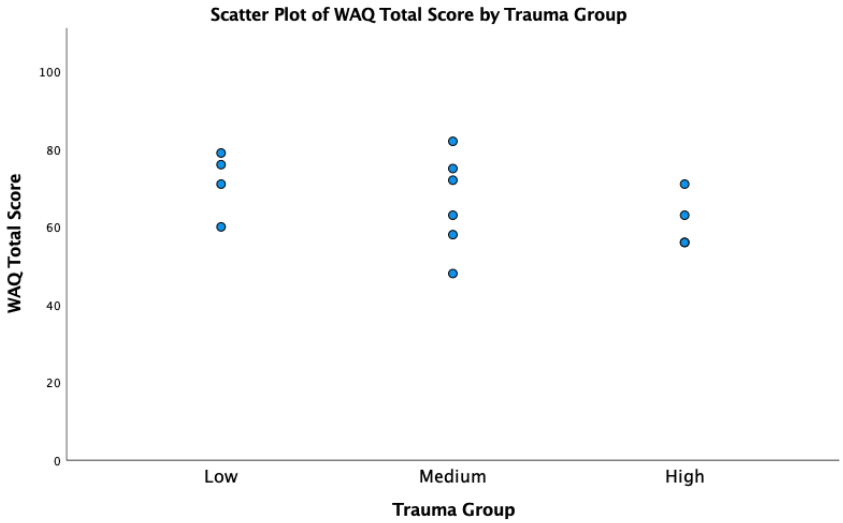
Table 4 *Select Characteristics and Outcomes by Trauma Group*

Measure/Variable	Low (*n* = 4) 75% (3) Men		Medium (*n* = 6) 67% (4) Men		High (*n* = 4) 75% (3) Men	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Trauma History						
Trauma Subtypes (of 24)[a]	3.50	2.38	8.17	0.98	12.75	0.96
Total Traumatic Events	8.50	4.80	25.17	4.07	353.50	615.02
Outlier Removed[b]	-	-	-	-	46.33	35.53
Age of Onset of Trauma	19.00	9.20	12.50	5.89	4.00	2.16
PCL-5 Score (PTSD Symptoms)	17.25	14.17	22.67	19.51	33.25	22.98
Substance Use History						
NM ASSIST (Across 10 Substances):						
Average Risk Score	6.78	4.90	10.43	4.02	5.95	2.83
Average Age of Onset of Use	18.19	3.09	20.44	3.46	20.59	5.54
Highest Risk Score	27.75	13.07	37.00	3.16	30.25	5.25
Youngest Age of Onset of Use	15.25	3.77	14.17	1.83	13.75	1.71
PACS Score (Craving)	13.00	12.57	2.83	4.17	11.50	10.21
Criminal History						
Crime Subtypes (of 24)	4.25	3.40	6.00	3.35	5.75	2.99
Total Criminal Offenses	42.50	61.81	227.83	394.42	67.25	100.71
Outlier Removed[b]	-	-	69.80	84.58	-	-
Age of Onset of Crime	16.33	1.53	16.67	2.07	17.25	6.40
POGS Rating (Charge Severity)	3.50	1.73	4.83	0.98	4.50	0.58
World Assumptions						
Total WAQ Score	71.50	8.35	66.33	12.40	61.50	7.14
WAQ CPP Subscore	17.00	1.41	12.17	3.13	13.50	2.38
WAQ TGP Subscore	16.75	7.14	20.17	4.36	16.75	3.30
WAQ CE Subscore	21.75	3.40	23.17	3.37	18.25	4.99
WAQ SV Subscore	16.00	5.72	10.83	5.04	13.00	2.94
3-Month Recidivism Outcomes						
Violation?	25% (1) Yes		33% (2) Yes		50% (2) Yes	
Release?	25% (1) Yes		67% (4) Yes		0% (0) Yes	
Still in Program?	50% (2) Yes		0% (0) Yes		50% (2) Yes	

Note. [a]This variable was used to group participants for the current analysis. [b]Participant removed for providing a value of over 1,000.

Figure 3 *Trauma Group Comparison Scatter Plots (n = 14)*





Note. PACS = Penn Alcohol Craving Scale; PCL-5 = PTSD Checklist for DSM-5; WAQ = World Assumptions Questionnaire.

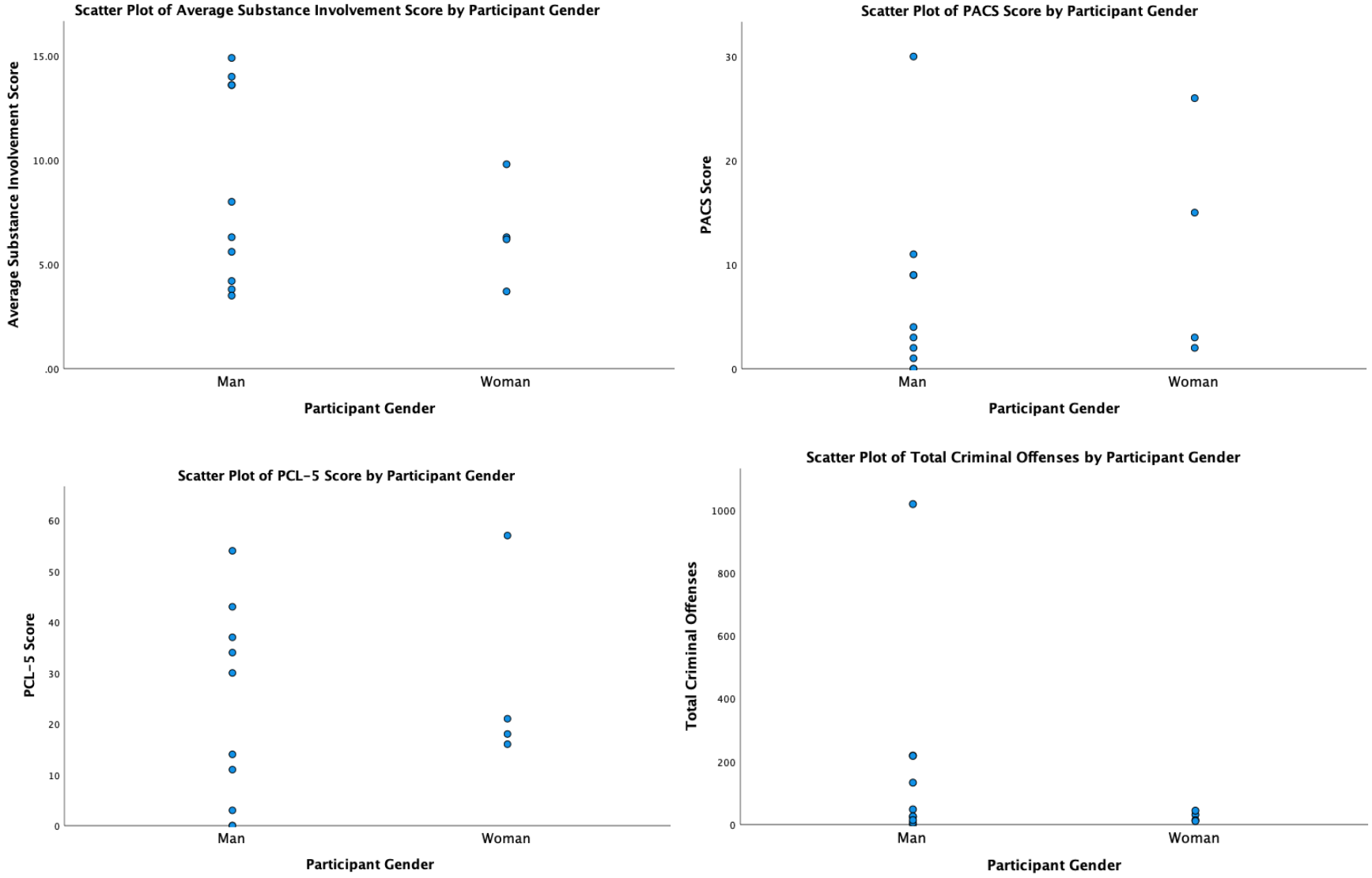
Table 5

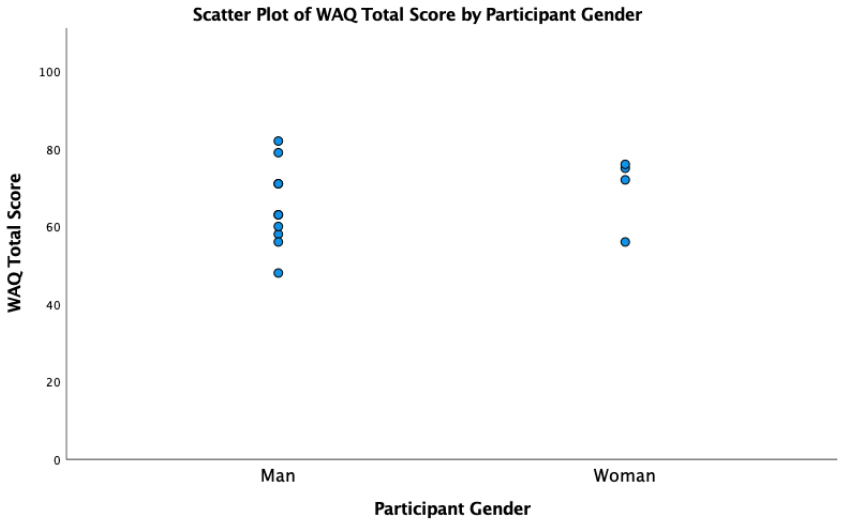
Select Characteristics and Outcomes by Gender

Measure/Variable	Men (n = 10)		Women (n = 4)	
	Mean	*SD*	Mean	*SD*
Trauma History				
Trauma Subtypes (of 24)	8.10	4.33	8.25	2.99
Total Traumatic Events	153.20	394.77	16.75	11.30
Outlier Removed[a]	28.56	23.35	-	-
Age of Onset of Trauma	12.70	9.50	10.00	4.55
PCL-5 Score (PTSD Symptoms)	22.60	19.46	28.00	19.44
Substance Use History				
NM ASSIST (Across 10 Substances):				
Average Risk Score	8.75	4.73	6.50	2.51
Average Age of Onset of Use	20.22	3.98	18.90	4.01
Highest Risk Score	33.30	6.68	30.25	12.23
Youngest Age of Onset of Use	14.70	2.41	13.50	2.38
PACS Score (Craving)	6.90	9.05	11.50	11.33
Criminal History				
Crime Subtypes (of 24)	5.40	3.41	5.50	2.65
Total Criminal Offenses	170.60	309.52	25.00	15.43
Outlier Removed[a]	76.44	89.70	-	-
Age of Onset of Crime	15.67	2.55	19.25	4.57
POGS Rating (Charge Severity)	4.50	1.18	4.00	1.41
World Assumptions				
Total WAQ Score	65.10	10.59	69.75	9.32
WAQ CPP Subscore	13.80	3.52	14.25	2.36
WAQ TGP Subscore	16.40	4.22	22.75	3.86
WAQ CE Subscore	21.80	4.66	20.25	2.75
WAQ SV Subscore	13.10	5.65	12.50	3.00
3-Month Recidivism Outcomes				
Violation?	40% (4) Yes		25% (1) Yes	
Release?	30% (3) Yes		50% (2) Yes	
Still in Program?	30% (3) Yes		25% (1) Yes	

Note. [a]Participant removed for providing a value of over 1,000.

Figure 4 *Gender Comparison Scatter Plots (n = 14)*





Note. PACS = Penn Alcohol Craving Scale; PCL-5 = PTSD Checklist for DSM-5; WAQ = World Assumptions Questionnaire.

Table 6

IPOD Sample Statistics

	Trauma Group				Gender				Overall	
Variable	Yes (*n* = 46)		No (*n* = 89)		M (*n* = 98)		F (*n* = 37)		*N* = 135	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Trauma History										
Proportion Yes	1.00	0.00	0.00	0.00	**0.18**	**0.39**	**0.76**	**0.44**	0.34	0.48
Substance Use Yrs.	12.76	7.88	13.04	8.53	13.28	8.63	12.08	7.31	12.95	8.28
Criminal Offenses	14.39	12.49	16.60	15.44	**17.49**	**15.62**	**11.49**	**9.87**	15.84	14.50
Recidivism										
Proportion Yes	**0.28**	**0.46**	**0.48**	**0.50**	0.45	0.50	0.32	0.48	0.41	0.50

Note. Statistically significant group differences ($p < .05$) are bolded.

Table 7

Logistic Regression Analyses Predicting IPOD Recidivism Outcome

Predictor	*B*	*SE*	β	*p*
Main Effects				
Gender	0.529	0.529	.129	.192
Trauma	-0.864*	0.390	-.220	.027
Substance Use	-0.036	-0.036	-.160	.117
Crime	0.005	0.012	.038	.693
Interaction Effects				
Gender × Trauma	-0.212	0.976	-.039	.828
Gender × Substance Use	0.058	0.070	.228	.404
Gender × Crime	-0.010	0.038	-.069	.799
Trauma × Substance Use	-0.040	0.059	-.096	.497
Trauma × Crime	0.022	0.029	.086	.437
Substance Use × Crime	0.002	0.002	.092	.404

Note. *Coefficient was significant at the $p < .05$ level. This effect became non-significant after gender was entered into the regression equation.

Table 8

Crosstabulation Counts (n) of Trauma, Recidivism, and Gender in IPOD

Trauma History	Recidivism Outcome	Male	Female	Total
Yes	Yes	5	8	13
	No	13	20	33
	Total	18	28	46
No	Yes	39	4	43
	No	41	5	46
	Total	80	9	89
Total	Yes	44	12	56
	No	54	25	79
	Total	98	37	135

CHAPTER 4

DISCUSSION

Revisiting the Aims

The overall goal of this dissertation was to better understand the complex histories of incarcerated adults, specifically with regard to trauma, substance use, and criminal behavior, and to identify potential targets of treatment to help these individuals break the cycle of criminal justice system involvement. This process first required integrating a large body of interdisciplinary literature to identify gaps in understanding. The review of the literature suggested that trauma and substance use are not only disproportionately prevalent in incarcerated offenders (e.g., Baranyi et al., 2018; Bodkin et al., 2019; Chandler et al., 2009; Fazel et al., 2017), but also are directly implicated in criminal behavior and recidivism (e.,g., Baltieri, 2014; Katsiyannis et al., 2018; Sadeh & McNiel, 2015; Zweig et al., 2012b). The literature review also revealed that researchers continue to debate questions of arguably limited clinical utility about "which came first" (Bennett et al., 2008; Hawn et al., 2020). Given compelling evidence that trauma, substance use, and crime share reciprocal associations across the lifespan (e.g., C. B. Clark et al., 2014; Lynch et al., 2017; Martin et al., 2015; Zweig et al., 2015), the study PI developed an innovative framework conceptualizing these phenomena as a composite "risk triad." This conceptualization aligns with the National Institutes of Health Research Domain Criteria (RDoC; Sanislow et al., 2010) initiative, which has promoted integrative research to identify underlying dimensions of comorbid conditions. Toward this end, the first aim of the study was to validate the novel "risk triad" conceptualization using a latent variable modeling approach.

The criminal justice system provides a window of opportunity for historically

underserved populations to receive treatment. However, access to empirically-supported interventions for substance use/SUD (Taxman et al., 2013) and/or trauma/PTSD (Pettus-Davis et al., 2019) remains limited in criminal justice settings. Further, even in the community, integrated PTSD-SUD treatment is sparsely available compared to interventions for either disorder alone (Flanagan et al., 2016; Vujanovic et al., 2016). This separation of services overlooks the mutually reinforcing relationship between substance use and trauma, which is especially pronounced within the context of a high-risk criminal lifestyle and subsequent incarceration (Hammersley, 2011). Interventions that target shared mechanisms may maximize the opportunity for behavior change without taxing available treatment resources in the criminal justice system. Despite this, potential underlying mechanisms of the "risk triad" have received little attention in the research literature (Ardino, 2012; Fritzon et al., 2021; Vujanovic et al., 2016).

It was from this rationale that the current study sought to identify a potential underlying mechanism of the "risk triad" as the second research aim. It was important for this mechanism to be malleable with clear and feasible treatment implications. The hypothesized mechanism of posttraumatic negative world assumptions (Brown et al., 2019; Janoff-Bulman, 1989; LoSavio et al., 2017), if supported by the proposed mediation analysis, would have provided a strong foundation for future research to adapt existing treatments such as CPT (Resick et al., 2016) to the unique needs of criminal offenders. The third and final aim of the study was to elucidate potential gender differences in the "risk triad" through moderation analysis. Results of this aim could have added clarity to a mixed evidence pool (Kruttschnitt, 2013) and had practical applications to the tailoring of treatment within gender-segregated criminal justice settings (Miller & Najavits, 2012).

The aims of this research were ambitious, relying on advanced statistical techniques that would require a large sample of participants (Fritz & MacKinnon, 2007). Hindered by a variety of barriers to study implementation and participant recruitment, including the arrival of the COVID-19 pandemic, these ambitions were far from met. The methodology of the study therefore was simplified to descriptive and preliminary in nature, supplemented with inferential analyses of a secondary dataset of another local inmate population. The results and limitations of these analyses will be summarized and interpreted first, followed by a discussion of greater lessons learned about barriers to research in criminal justice settings. The discussion will conclude with a reflection on societal events of the past year that have shaped the researcher's perspective and can provide directions for future research.

Summary and Interpretation

Snapshot of the "Risk Triad"

Findings from the CCP study revealed that, even within a small sample of relatively low-risk criminal offenders, rates of substance use were markedly elevated. All participants scored within the moderate to high range of lifetime substance involvement/risk on at least one substance category on the NM ASSIST. These rates were higher than those observed in a previous study of the NM ASSIST with high-security male prisoners, 66.0% of whom scored within the moderate-high risk range on at least one substance category (Wolff & Shi, 2015). Alcohol emerged as the most problematic substance in the current sample, with 85.7% of participants endorsing moderate-high lifetime alcohol involvement. In contrast, only 41.0% of the high-security prison sample reported moderate-high alcohol involvement, with cannabis emerging as the most problematic substance instead (Wolff & Shi, 2015). These findings and comparisons make sense given that over half of the current participants were in

CCP custody for a DWI charge, and only one participant had committed a more serious, violent index offense (domestic assault). On the other hand, alcohol has a particularly well-established relationship with the violent crime that is more characteristic of high-security prison inmates (B. C. Clark et al., 2012; Kopak et al., 2014). With regard to past-week general substance craving, the average modified PACS score in the current study was 8.2 out of a maximum score of 30. This was lower than the average modified PACS score obtained in a sample of SUD treatment seekers at baseline (19.6) and roughly equivalent to the post-treatment score (7.5) among that sample (Costello et al., 2020).

The current results are only preliminary, as the sample size was not conducive to firm conclusions about CCP inmates' substance use patterns. In addition, neither the NM ASSIST (NIDA, 2009) nor the PACS (Flannery et al., 1999) is a diagnostic measure of SUD. However, based on these results, it appears that substance use played a large role in the lifetime trajectories of the CCP inmates. Relatedly, access to SUD treatment, and AUD treatment in particular, may be essential for the rehabilitation of the CCP population. Given that many CCP inmates are enrolled in community SUD treatment, the difference between participants' lifetime substance involvement scores and comparatively low ratings of recent craving might indicate the success of this programmatic approach.

Rates of trauma and PTSD symptomatology also were very high in the CCP sample. Participants disclosed experiencing a minimum of 2 and an average of 24.9 lifetime traumatic events (excluding an extreme outlier participant who reported over 1,000 events). Again, these rates were higher than those previously observed in a sample of Arizona prisoners, who reported an average of 6.7 lifetime traumatic events (Carlson & Shafer, 2010). Likewise, 35.7% of the current sample scored in the range of probable PTSD diagnosis on the PCL-5

(Bovin et al., 2016). This rate was much higher than the pooled prevalence rates generated in an international meta-analysis, which identified PTSD in 6.2% of incarcerated men and 21.1% of incarcerated women (Baranyi et al., 2018). As the meta-analysis noted, however, there is substantial variation across studies of different criminal justice populations. In two prior studies of incarcerated men (Öğülmüş et al., 2020) and women (Baker et al., 2021), the average PCL-5 scores of PTSD symptom severity were 41.8 and 36.8, respectively, higher than the average PCL-5 score of 24.1 within the current sample. Despite the mixed impressions from these comparisons to previous research, the high extent of trauma and PTSD symptoms among the CCP inmates was nonetheless striking.

The small sample size was not conducive to testing statistical associations among trauma, substance use, and criminal offending. However, breaking down the sample by trauma history groupings provided another interesting snapshot of the data. An unexpected pattern began to emerge in which, on average, the medium trauma group reported higher levels of lifetime substance use and criminal offending than the low trauma and high trauma groups, yet also reported the lowest degree of past-week substance craving. As visualized in the scatter plots in Figure 3, high variability within each of the trauma classifications decreased the meaningfulness of these group averages. The medium trauma group also contained the largest proportion of participants. Nonetheless, it is possible that participants with moderate trauma had more severe substance use histories, and consequently more experience with substance use treatment and recovery skills that may have accounted for their discrepancy between high substance involvement and low craving. It would be interesting for future researchers to replicate low, medium, and high trauma classes of offenders to investigate whether pronounced sequelae of moderate trauma would emerge in a

larger sample. To the author's knowledge, no prior studies have utilized this precise approach. However, given consistent findings of a linear dose-response relationship between trauma and negative outcomes (Fox et al., 2015; Friestad et al., 2014; Haller & Chassin, 2014; Jäggi et al., 2016), the group averages observed herein seem unlikely to replicate.

The generally high rates of trauma and substance use among the CCP inmates, again, may have been an artifact of small sample size and greater variability than would materialize in a larger sample. The small sample and difficulties with recruitment also raise the possibility of selection bias; for example, perhaps CCP inmates with greater histories of trauma were more attracted to a research study that expressed interest in these experiences. In addition, Hooper et al.'s (2011) psychometric review of the THQ cautioned that the self-report version of the measure may lend itself to overreporting. Therefore, the present findings should be interpreted with much restraint. However, it should also be noted that New Mexico is one of the poorest states in the country with the highest rate on record of child maltreatment (Barboza-Salerno, 2020). In addition, New Mexico has consistently ranked above the national average on indicators of problematic substance use including drug overdose and alcohol-related death (New Mexico Department of Health, 2021). It is thus possible, and worth ongoing scientific investigation, that incarcerated offenders in New Mexico may present with above-average levels of trauma, PTSD, and SUD symptomatology compared to incarcerated offenders from other geographic locations. At this time, there are no known studies of New Mexico offenders that utilized the same assessment measures to facilitate comparisons with the current findings. To the limited extent possible, this dissertation approximated such comparisons by including supplementary analyses of a New Mexico jail sample. These preliminary findings will be described below.

As mentioned, there has been one prior documented study of the CCP population (Freeman, 2006). Despite the 15-year time lapse and much smaller sample size of the current study, the demographic composition of the two samples was remarkably similar in terms of age, race/ethnicity, gender, charge level, and court status. Based on the two studies, the average CCP inmate appears to be a Hispanic man in his mid-30s who has been sentenced to the CCP for a non-violent misdemeanor conviction. Likewise, while Freeman (2006) found that 31% of CCP inmates incurred a program violation within an average of 51 days following CCP admission, the present study found a 36% violation rate within an average of 46 days since admission. In both samples, the most common type of violation was a positive drug test. These similar findings increase confidence that the current study provided a reasonably accurate snapshot of CCP inmates' background and functioning.

World Assumptions Findings

The limited statistical power of the CCP sample precluded the ability to test the hypothesized role of world assumptions as a mechanism or mediator, and the IPOD study did not include any measures of world assumptions. However, the preliminary CCP results were encouraging in that negative world assumptions appeared to share a linear relationship with trauma history among CCP inmates. This was the first known study to utilize the WAQ in an inmate population, as previous studies of world assumptions in incarcerated adults (Maschi & Baer, 2013; Maschi & Gibson, 2012) and juveniles (Maschi et al., 2010) utilized the WAS (Janoff-Bulman, 1989). In two of those three studies, trauma was significantly associated with negative world assumptions (Maschi et al., 2010; Maschi & Gibson, 2012). Compared to previous research on the WAQ, the CCP inmates endorsed more negative world assumptions than a college student sample (average scores of 66.43 versus 75.71,

respectively; Schuler & Boals, 2016) and more positive world assumptions than Iraqi civilian bombing victims (average score of 52.57; Freh et al., 2013). It remains to be tested whether world assumptions may share a link with criminal behavior and other recidivism risk factors among offenders.

It should be noted that the WAQ demonstrated poor internal consistency reliability in the current study. This simply may have been due to the very small sample size, although the other study measures had good internal consistency. Previous studies reported adequate to good internal consistency for the WAQ (Freh et al., 2013; Kaler, 2009; Schuler & Boals, 2016). However, a recent study of college students found that the WAQ lacked measurement invariance across race/ethnicity, sex, and sexual orientation, raising concerns that it may measure different constructs in different demographic groups (Haeny et al., 2021). The authors recommended a reduced-item version of the WAQ that they found to be psychometrically superior. Future research should continue to test the psychometric properties of the WAQ in incarcerated offenders and other diverse samples that have adequate statistical power. Researchers may also consider adjunctive measures of world assumptions to investigate the construct more deeply. The newly developed Trauma-Related Cognitions Scale (TRCS; Valdez et al., 2021), for example, differentiates between accommodated and over-accommodated beliefs (see Resick et al., 2016) to distinguish between adaptive and maladaptive posttraumatic changes in worldview. A downside of the TRCS and similar instruments is that it explicitly ties beliefs to trauma and therefore is not applicable to individuals without trauma histories. However, given that all participants in the current study endorsed at least some history of trauma, a broadly applicable world assumptions measure was not as important as originally anticipated.

Supplementary Aim Findings

The IPOD sample of New Mexico jail inmates had moderately high rates of baseline physical/sexual abuse (34%) and follow-up recidivism (41%). The most striking contribution of the IPOD analyses was the unexpected finding that inmates with (versus without) a history of interpersonal trauma were significantly less likely to be re-arrested during the 12-month follow-up period. Although not statistically significant, participants with an interpersonal trauma history also reported lower baseline levels of substance use and criminal offending. These findings contradicted the growing body of research to conclude that trauma increases the risk of criminal recidivism (e.g., Jung & Lee, 2021; Sadeh & McNiel, 2015; Vitopoulos et al., 2019; Zweig et al., 2012b, 2015) as well as the predisposing recidivism risk factors of substance use (e.g., Friestad et al., 2014; Hawn et al., 2020) and crime (e.g., Fox et al., 2015; Jäggi et al., 2016). However, regression analyses revealed that trauma did not significantly predict recidivism when participant gender was statistically controlled. The role of gender is discussed more below.

It should be clarified that the IPOD study was neither designed nor optimized to measure posttraumatic responses. Trauma-related constructs available in the dataset were limited to two yes/no items about history of physical and sexual abuse that were embedded in a broader structured clinical interview (the ASI-Lite). Although these two ASI items previously showed good specificity and acceptable sensitivity (Langeland et al., 2003), they do not provide information that may be more pertinent to recidivism risk than the simple presence or absence of lifetime trauma. Specifically, previous research has highlighted the criminal risk conferred by more nuanced trauma-related variables such as early-onset trauma (Broidy et al., 2018; Grella et al., 2005; Jung & Lee, 2021), the accumulation of multiple

traumatic experiences (Fox et al., 2015; Jäggi et al., 2016; Karatzias et al., 2018), and diagnostic symptoms of PTSD (Proctor et al., 2017; Sadeh & McNiel, 2015; Sherman et al., 2014). It should also be noted that physical and sexual abuse represent a small fraction of potential traumatic events. In the current CCP study, for example, all participants endorsed experiencing trauma of the general/disaster type (e.g., serious accidents, witnessed violence), but 6 of the 14 participants denied a history of assault. Unfortunately, data about the timing, amount, variety, and impact of trauma were not collected in IPOD, limiting the interpretability of the current findings.

Neither lifetime years of substance use nor total criminal charges significantly predicted recidivism in IPOD. These findings too may be due to the limited utility of the ASI to capture more detailed information about lifetime substance use and criminal behavior. Equally possible is that the recidivism outcome was influenced by unmeasured variables. For example, perhaps inmates with higher risk factors received more treatment or support services prior to, during, or after incarceration that could have protected against recidivism. Data about service utilization were not available beyond the opioid use disorder treatment (injectable naltrexone and patient navigation) provided in IPOD, which had low adherence rates and did not produce significant treatment effects (Farabee et al., 2020).

The Role of Gender

In both the CCP and IPOD studies, women presented with higher average levels of trauma/PTSD and fewer lifetime criminal offenses than their male counterparts. These findings are consistent with published meta-analyses (Baranyi et al., 2018; Bodkin et al., 2019; Kruttschnitt, 2013). In light of the unusual IPOD recidivism finding, it was hypothesized that gender may have moderated the inverse association between interpersonal

trauma history and recidivism. This hypothesis was bolstered by the descriptive crosstabulation results. Although the interaction term between trauma and gender was not statistically significant, the main effect of trauma on recidivism became non-significant when gender was entered into the model. There was no main effect of gender on recidivism despite male and female IPOD participants recidivating at noticeably different rates (45% versus 32%, respectively). Power analysis in G*Power 3.1 (Faul et al., 2009) revealed that the computed effect size of d = .27 was powered at only the .28 level to detect a significant gender difference in recidivism. Either a large effect size (d = .54) or much larger sample (n = 450) would have been required to achieve .80 power on this parameter. A statistically significant gender difference likely would have materialized in a sufficiently large sample, as a national meta-analysis of 20 years of recidivism data identified male gender as the single strongest predictor of recidivism out of 35 studied variables (Katsiyannis et al., 2018).

The IPOD sample was also likely underpowered to detect any interaction effects, particularly given the unequal sizes of the comparison groups (see Aguinis et al., 2017). Concerns about statistical power to detect gender moderation have been expressed in previous studies of criminal offenders (Martin et al., 2015; Zweig et al., 2015). Gender-moderated relationships among trauma, substance use, and criminal behavior are worth ongoing investigation in larger samples, as recent research has continued to produce mixed results. For example, whereas Vitopoulos and colleagues (2019) found that gender did not moderate the association between trauma and recidivism in juvenile offenders, a new study found that childhood trauma predicted recidivism in female but not male adult offenders (L. Liu et al., 2021). Clarification of potential gender differences in pathways to recidivism could provide essential information to assist with the allocation of limited treatment resources

within the criminal justice system.

Barriers to Research in Criminal Justice Settings

Perhaps the most valuable findings from the current study were the anecdotal challenges of conducting research with a criminal justice agency. The many obstacles to the implementation of the CCP study are highlighted in Figure 2. A small body of literature has commented on the ubiquity of these obstacles, noting that research in a criminal justice agency can take months to years longer than it would in another community setting (Barta et al., 2016; Kitt-Lewis et al., 2020). Indeed, over 1.5 years passed from the time the PI received informal CCP approval for the study to the eventual beginning of participant recruitment. The literature cites frequent criminal justice agency staff turnover and reassignment as one of the central barriers to research. In the current study, the CCP underwent four administrative staff changes that substantially slowed the timeline. Each of these administrative changes required building rapport, providing study information, and ultimately gaining support to proceed with the study as planned. This process entailed persistent advocacy and repeated efforts at communication; as Kitt-Lewis et al. (2020, p. 75) reflected, “response times ranged from no response, to immediate, to many months.”

The above-cited authors also pointed to the status of inmates as a vulnerable population and related precautionary measures as factors that often delay research in criminal justice settings. In the current study, the IRB review and requested modifications took approximately 3 months. More troublesome was the unexpected notice 2 months following IRB approval, prompted by a CCP staff change, that there would be an additional research approval process at the Bernalillo County level. This extra gatekeeper approval is common according to the literature, and “can be held up by one person and without cause for several

months" (Barta et al., 2016, p. 36). The authors indicated that gatekeeping is driven in part by concern that research could create a liability or bad publicity for the agency. This concern was evident in the current study, as the county reportedly established the research approval process following a lawsuit.

The literature also provides strategies for successful research implementation, several of which facilitated the current study and prevented it from completely dissolving as research proposals in criminal justice settings often do (Barta et al., 2016). Kitt-Lewis et al. (2020, p. 77) suggested that "researchers may need to rely on word-of-mouth references and support to gain system access." In the current study, involving academic affiliates who had established relationships with county officials was key to receiving permission from the county to proceed. These authors also recommended researchers to identify a primary contact person within the collaborating criminal justice agency. In this case, developing a line of communication with the CCP Social Services Coordinator facilitated the continuation of data collection throughout the follow-up period despite changes in administrative staff. Barta et al. (2016) cautioned that agency staff may have a negative attitude toward research due to a perceived lack of benefits over costs. However, this problem did not present in the current study, as CCP staff consistently vocalized support of the research despite the obstacles and setbacks. The PI was proactive in highlighting goals of the study that aligned with staff values, framing the recidivism reduction goal as "finding ways to keep the same people from coming back" (a frustration to which many law enforcement personnel can relate).

Finally, it should be noted that even after the institutional barriers were resolved, the study faced new obstacles in the form of CPP inmates' hesitation to participate in the study. The $40 incentive to participate did not garner as much appeal as anticipated by the research

team and CCP staff. The literature primarily focuses on the logistics of conducting research with physically confined inmates, a "captive audience" who often volunteer for research to receive compensation or simply novel stimulation outside of their daily routines (Copes et al., 2013). The current study did not gain momentum until 7 months after the start of recruitment, once the PI had established a regular presence at the CCP office. This lesson solidified the importance of developing rapport and building the trust of not just agency staff, but also the CCP inmates. Otherwise, individuals who are under community supervision, particularly in programs with extensive requirements like the CCP, might refrain from altering their strict schedules to participate in research.

Broadened Perspectives in the Year 2020

The final barrier to this dissertation was the arrival of the COVID-19 pandemic, which delayed and eventually halted the plan to recruit and collect baseline data for approximately 5 more months just after the study had gained traction. Around that same time, George Floyd was murdered by Minneapolis police, sparking a resurgence of the Black Lives Matter movement and worldwide protests against police brutality. These two global events cast a new spotlight on the United States criminal justice system and its overdue need for sweeping reform. Collecting follow-up data during this era prompted additional reflections about the role of researchers in criminal justice settings. In retrospect, to have examined trauma, substance use, criminal behavior, and recidivism without attending to experiences of racism and oppression was a serious oversight. For all good intentions, mental health services can only function effectively within criminal justice systems to the extent that those systems are equitable and humane. Cognitive restructuring interventions are futile if individuals' negative cognitions accurately reflect a grim reality.

Indeed, the hypothesized mechanism of world assumptions may not have mediated the pathway between the "risk triad" and recidivism when controlling for sociodemographic variables. General strain theory scholars have cited contextual disparities that reinforce "criminal coping," including low environmental control, antisocial peer influence, and lack of access to prosocial means of resolving trauma such as treatment and legal resources (Agnew, 2001; Apel & Burrow, 2011). Likewise, Seddon (2006) noted that the drug–crime connection tends to be clustered in communities that are excluded from viable economic opportunities. Katsiyannis et al.'s (2018) meta-analysis quantitatively confirmed the increased recidivism risk conferred by low social achievement and family criminal involvement. Thus, research on micro-level psychological risk factors for recidivism must be vigilant to avoid the common pitfall of downplaying macro-level risk factors that call for societal introspection and multisystemic reform.

In a recent article, Ratele and Malherbe (2020, p. 2) commented on the historical failure of psychologists to engage in anti-racist work, which primarily "has fallen upon grassroots activism" and been treated as "superfluous" within the field. The authors called on psychologists to actively "bend psychology to the will of anti-racism, and never vice versa" (p. 4). As a starting point, future research on trauma among incarcerated populations can broaden the traditional definition of trauma to include experiences of racism, which emerging research has shown can induce stress reactions akin to PTSD (Carter et al., 2020). Inquiring about experiences of police violence and modifying cognitive-behavioral interventions to validate non-white (and particularly Black) individuals' realistic appraisals of safety is also indicated (Klein & Lopez, 2021). In addition, anti-racist mental health professionals will have to contend with the widespread racial trauma of the COVID-19 pandemic, which has

disproportionately caused illness, death, and economic hardship for non-white groups (S. R. Liu & Modir, 2020). Understanding and addressing trauma and other mental health needs among community corrections participants will be particularly important, as COVID-19 has pushed criminal justice systems to expand community supervision programs in lieu of mass confinement (Nowotny et al., 2020).

Conclusions

The current study set an ambitious agenda to reconceptualize trauma, substance use, and criminal history as overlapping risk factors for recidivism with potential shared underlying mechanisms and gender differences that could aid future intervention and recidivism prevention efforts. These aims were not realized due to a number of barriers that resulted in a very small sample size and lack of statistical power to test the proposed hypotheses. Regardless, the descriptive findings suggested that trauma and substance use are indeed pressing concerns and likely linked to criminal behavior among lower-risk adult offenders enrolled in a community custody program in New Mexico. The preliminary world assumptions findings also were promising in that higher trauma exposure corresponded with more negative world assumptions, providing a basis for continued research on world assumptions and their potential applicability to interventions for offenders. The proposed analytical model is worth testing in the future and can heed the lessons learned about barriers and strategies for conducting research in a community corrections setting. Special efforts to recruit a large mixed-gender sample will be important to test gender differences that have potential implications for treatment and recidivism. Finally, the societal events of 2020 served as a reminder that standard definitions of trauma should be broadened to capture experiences of racism within and outside of the criminal justice system. Research that attends

to both individual and systematic risk factors for recidivism is essential to helping marginalized populations transcend the cycle of incarceration.

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