

THE TRIFECTA EFFECT: THE INCARCERATED WOMAN'S TRIPLE COMORBIDITY  
AND ASSOCIATIONS WITH RECIDIVISM

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## ABSTRACT

### THE TRIFECTA EFFECT: THE INCARCERATED WOMAN'S TRIPLE COMORBIDITY AND ASSOCIATIONS WITH RECIDIVISM

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Jails are the front door to the criminal justice system, serving as the initial point of contact with inmates (Raggio, Hoffmann, & Kopak, 2017). Females in jail are the fastest growing correctional population (Swavola, Riley, & Subramanian, 2016). Females experience comorbid psychopathologies and substance use disorders at a higher rate than men, and incarcerated populations experience these disorders at far greater rates than the general population (Al-Rousan, Rubenstein, Sieleni, Deol, & Wallace, 2017; Fazel, Yoon, & Hayes, 2017; Logan & Blackburn, 2009; Lynch S. M., et al., 2017; Swavola, Riley, & Subramanian, 2016). This study investigates the relationship between comorbid psychopathologies and methamphetamine and opioid substance use disorders with criminal justice outcomes in a sample of females recently incarcerated in three rural jails. Diagnostic indicators were compared with official records to elucidate these relationships. It was hypothesized that multiple comorbidities and severe substance use disorder would have the strongest relationship with recidivism, but results indicate that only severe Amphetamine Use Disorder has any significant associations with recidivism. Results from this study have implications for treatment and security of females incarcerated in local jails.

*Keywords:* Jail, Female, Methamphetamine, Opioids, Comorbid Psychopathologies, Recidivism, Corrections, Drug Abuse, Substance Abuse.

## CHAPTER 1: INTRODUCTION

Jails are the front door to the criminal justice system, serving as the initial point of contact with inmates (Raggio, Hoffmann, & Kopak, 2017). There was a total of 2,172,800 individuals incarcerated in either jails or prisons in the United States in 2016 (Kaeble & Cowhig, 2018). Of those individuals, 111,616 were women serving sentences in state or federal prisons (Carson, 2018), and 102,300 women were confined in jail facilities (Zeng, 2018). Prisons typically house individuals who have been convicted of a crime and sentenced to incarceration for a year or longer, most often for a felony offense (Riley, et al., 2017). Jails on the other hand, house a broad variety of inmates, facing the full spectrum of offenses in regard to severity, whom are awaiting court proceedings, transports to other facilities, family members to gather funds for bail/bond, and those serving short sentences of typically less than a year (Binswanger, et al., 2010; Kang-Brown, Hinds, Heiss, & Lu, 2018; Kang-Brown & Subramanian, 2017; Proctor & Hoffmann, 2012; Subramanian, Delaney, Roberts, Fishman, & McGarry, 2015). Some states have restructured legislation to reduce prison sentences by mandating that some lower level offenses be served in county jails rather than state prisons (with North Carolina being one of those states) (Kang-Brown & Subramanian, 2017). This practice adds further heterogeneity to the jail populations, additional strain to strapped resources and personnel, as well as contributing to the continued increase in the number of individuals incarcerated in jails (Kang-Brown, Hinds, Heiss, & Lu, 2018). Women in jails are the fastest growing population of any other correctional population (Swavola, Riley, & Subramanian, 2016). Between 2010 and 2013, for example, the number of men and women decreased across all correctional populations, except for women in jails (up 11 percent) and men on parole (up 2 percent) (Glaze & Kaeble, 2014). The vast majority

of the empirically derived knowledge base involving incarcerated populations has been obtained through the study of prison populations (Staton-Tindall, et al., 2015), with jails continually being the least studied form of incarceration (Apel, 2016). Nationally there appears to be a decline in incarcerations, but upon closer inspections of state and local incarceration trends, national declines have been driven by large urban populations sending less people to jail and prison, with smaller metro and rural areas continuing to see growth or maintaining high incarceration rates (Kang-Brown, Hinds, Heiss, & Lu, 2018). One factor contributing to high incarceration rates is the use of pretrial detention, which is a population growing much faster than prison populations, with rural pretrial incarceration rates surpassing the rates of large urban and suburban incarceration rates (Kang-Brown & Subramanian, 2017).

The most recent national information on psychological distress in incarcerated populations was gathered using the Kessler 6 (K6) nonspecific psychological distress scale, a six item self-report tool which was developed to screen for serious mental illness in adults in the general population in the US. An additional self-report measure was administered in this survey asking the participants if they had been told by a mental health professional they had any of the listed mental health diagnoses ((1) manic depression, bipolar disorder, or mania; (2) a depressive disorder; (3) schizophrenia or another psychotic disorder; (4) post-traumatic stress disorder; (5) another anxiety disorder, such as panic disorder or obsessive compulsive disorder; (6) a personality disorder, such as antisocial or borderline personality; or (7) a mental or emotional condition other than those listed above?) to determine a history of mental health problems. This survey indicates that 26% of jail inmates reported experiences that met thresholds for serious psychological distress (SPD) in the 30 days prior to the survey, and 44% of jail inmates had been told in the past they had a mental health disorder by a mental health professional (Bronson &

Berzofsky, 2017). The percentage of inmates with psychological distress is considerably more than that of adults in the general U.S. population, and for women these percentages are significantly higher than for men. Whereas 26% of male jail inmates met threshold for SPD, 32% of female jail inmates meet this same threshold (Bronson & Berzofsky, 2017). However, other research has indicated that using the general-population based cutoff score (as was used in the Bureau of Justice Statistics Report (Bronson & Berzofsky, 2017)) with jail populations is problematic, as it results in a high proportion of individuals incorrectly identified as not having mental health problems (Kubiak, Beeble, & Bybee, 2012). Thus, the widely cited national statistics may in fact be an underrepresentation of current prevalence rates of SPD in jails. An even more striking difference in mental health problems faced by individuals in jails is the number of female inmates whom had been told in the past by a mental health professional they had a mental health disorder versus their male counterparts. Whereas 41% of male jail inmates had been told they had a mental health disorder, 68% of female jail inmates, had been told the same thing by a mental health professional (Bronson & Berzofsky, 2017). In a multisite study of the prevalence of several presenting concerns in female jail inmates, the combined sample yielded a high prevalence of mental health disorders, with 91% meeting lifetime criteria, and 70% meeting 12-month criteria. This study also found that 43% of the sample met lifetime, and 32% of the sample met current criteria for a Serious Mental Illness (SMI), with a definition of SMI including major depressive disorder, bipolar disorder, and psychotic spectrum disorders (Lynch S. M., et al., 2014). With a majority of incarcerated females having a history of mental health problems, it appears to be a norm, rather than the exception, for this population to have mental health concerns.



The most common mental health concerns in incarcerated populations, according to the most recent national estimates, include Major Depressive Disorder (Prison (P) population: 24%, Jail (J) population: 31%), Bipolar Disorder (P: 18%, J: 25%), Anxiety Disorders (P: 12%, J: 18%), PTSD (P: 13%, J: 16%), and Personality Disorders (P: 13%, J: 14%). These are much higher rates of these disorders than what is found in the general population and strikingly, the prevalence of these conditions is significantly higher in jail populations, than they are in prison populations (Bronson & Berzofsky, 2017). It is estimated that more than two million individuals with serious mental illness are booked into jails in a years' time (Steadman, Osher, Robbins, Case, & Samuels, 2009). One study comparing mental health between facility type (prison vs. jail), found that those incarcerated in jails had significantly higher odds of having depression, higher life dissatisfaction, and illicit drug use than those incarcerated in prisons (Yi, Turney, & Wildeman, 2017). Rates of disorders in female populations sampled from multiple jails in different regions across the United States found that women met lifetime and current rates of Major Depressive Disorder (Lifetime (L): 28%, Current (C): 22%), Bipolar Disorder (L: 15%, C: 8%), PTSD (L: 53%, C: 29%), and Schizophrenia Spectrum Disorders (L:4%) at high rates (Lynch S. M., et al., 2014). Even in the general population, women have 1.5 to 3-fold the rates of Major Depressive Disorder than men, experience anxiety approximately twice as much, and have higher rates of PTSD and Personality Disorders (except for Antisocial Personality Disorder), than their male counterparts (American Psychiatric Association, 2013). In a sample of newly admitted participants to a drug treatment program in a prison, women were 2.2 to 3.3 times more likely than men to have Major Depression, PTSD, Borderline Personality, or any Affective, Anxiety, or Psychotic Disorder (Zlotnick, et al., 2008). This is consistent with prior nationally representative data indicating that women in jails have higher odds of depressive,

bipolar, psychotic, posttraumatic stress, and any psychiatric disorder versus their incarcerated male counterparts, even when adjusting for sociodemographic variables, as well as drug and alcohol dependence (Binswanger, et al., 2010). Women not only have higher rates of mental health diagnoses than men, they also report greater severity in symptomology as well, indicating that women have greater treatment needs than men, who constitute a larger portion of the incarcerated population (King, Tripodi, & Veeh, 2018).

Although research has consistently documented high prevalence rates of mental health concerns among incarcerated women, the methods, measurement instruments, and diagnostic definitions have all been heterogeneous for gathering this information. The nationally representative statistics were gathered with a nonspecific self-report distress scale that only gathers current distress (within the past 30 days), and may severely underrepresent the number of people experiencing mental health problems within jail facilities (Bronson & Berzofsky, 2017; Kubiak, Beeble, & Bybee, 2012). Lynch and colleagues (2014) utilized the Composite International Diagnostic Interview (CIDI), a structured interview instrument designed to be used by nonclinicians, to gather prevalence information. This instrument assesses lifetime and 12-month rates of a wide range of mental health disorders to include major depression, bipolar disorder, PTSD, and substance use disorders, but was only used as a screener for psychotic disorders, and an adapted version of the psychotic disorders module of the Structured Clinical Interview for DSM disorders (SCID-I) was used to assess the full range of schizophrenia spectrum disorders with those who had a positive psychotic symptom endorsement on the CIDI (Lynch S. M., et al., 2014). The instruments used by Lynch and colleagues (2014) provides robust information, however, the interviews take one to six hours to complete, with their team averaging 1.95 hours to administer, which is a significant time burden for data collection efforts.

Steadman and colleagues (2009) used the Brief Jail Mental Health Screen (BJMHS) on all incoming inmates, and administered the Structured Clinical Interview for DSM-IV (SCID) on a subgroup of inmates selected through systematic sampling to estimate prevalence rates. Zlotnick and associates (2008), likewise used the SCID, in conjunction with other assessment instruments, to estimate rates. The SCID, like the CIDI, provides comprehensive assessment information for accurate diagnosis and prevalence rates, however it can only be administered by a trained clinical interviewer or mental health professional (Steadman, Osher, Robbins, Case, & Samuels, 2009), and also takes a considerable amount of time to administer. The BJMHS is an eight item, yes no response option, screening measure that assesses 6 current mental health symptoms, with one question regarding current psychiatric medication, and one question regarding prior psychiatric hospitalization (Steadman, Scott, Osher, Agnese, & Robbins, 2005). The validation of this instrument has had widely varying proportions of sensitivity and specificity with incarcerated females. The initial validation study reported that only 61.6% of the females in the sample were classified correctly, with 45.9% sensitivity and 72.9% specificity. Of the subsample of females that were also administered the SCID, 34.7% of that sample were incorrectly identified as not having a mental health disorder when in fact they did, and 45.1% were incorrectly screened as having a mental health disorder in need of further assessment, when in fact they did not. In the subsequent validation study of this instrument specifically for female populations, sensitivity was 61% and specificity was 75%. The false negative rate of the instrument in the subsequent validation study was calculated at 14%, which the authors concluded to mean that the confidence interval for false-negatives for female detainees to be between 14% and 37% (Steadman, Robbins, Islam, & Osher, 2007). Other studies have found similar sensitivity and specificity rates as the revalidation study, but also highlight the fact that the BJMHS does not assess criteria of

PTSD which is highly salient in incarcerated female populations (Eno Louden, Skeem, & Blevins, 2013). Other researchers have highlighted that oversampling of inmates with mental health needs for the validation studies may have contributed to the low positive predictive power, which in turn limited its testability with female detainees. These same researchers also point out that the lack of attention to anxiety and personality disorders also limits the utility of brief mental health screens in correctional populations (Ford, Trestman, Wiesbrock, & Zhang, 2009). The self-report surveys used by Binswanger et al. (2010) and Yi, Turney, and Wildeman (2017) are limited in the mental health issues measured. The Survey of Inmates in Local Jails, used by Binswanger and colleagues (2010), asked participants if they had ever been told by a mental health professional, such as a psychiatrist or psychologist, they had a disorder such as a depressive, bipolar, psychotic, posttraumatic stress, other anxiety, or personality disorders, which consequently lacks information of current or lifetime disorders, functional impairment, co-occurring substance use, and severity of the disorder. The indicators of mental health and depression used by Yi, Turney, and Wildeman (2017) were taken from the Fragile Families and Child Wellbeing Study, which was a longitudinal study that used the Composite International Diagnostic Short-Form to measure depression, and single item responses measuring life dissatisfaction, heavy drinking, and illicit drug use to draw conclusions from. With the limited amount of information these surveys obtain, there is considerably little knowledge that can be culled from the data. The high rates of mental health problems in females in jails alone warrants further research with this population, however, high turnover rates, with many booked into the jail staying less than 24 hours (Kubiak, Beeble, & Bybee, 2012), prohibit the use of lengthy structured diagnostic interviews, which may require specialized training. The use of different methodology, instruments, and diagnostic definitions also makes it difficult to generalize across

studies, further limiting our understanding of this high risk population. There is an apparent need to better comprehend what contributes to incarceration of individuals with mental health disorders, as we have returned to conditions that Dorothea Dix fought so hard to reform, with more individuals with serious mental illness in jails and prisons than in hospitals (Torrey, Kennard, Eslinger, Lamb, & Pavle, 2010). Yet, there is still so much ground to cover to elicit a more comprehensive scope of what maintains the momentum of the revolving door that keeps these individuals cycling between incarceration and their communities (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009; Fu, et al., 2013), which involves continuous study and generation of pathways to reform.

## CHAPTER 2: LITERATURE REVIEW

Women find themselves involved in the criminal justice system via different pathways than males (Broidy, Payne, & Piquero, 2018; Salisbury & Van Voorhis, 2009). Narratives of women offenders' life histories include poverty-stricken backgrounds, lifelong histories of traumatic and abusive incidences, serious mental illnesses in conjunction with self-medicating behaviors as coping mechanisms, little social support, dysfunctional intimate relationships, and difficulty managing and providing for dependent children, that are unique to, or seen in higher proportions, in female inmate populations (Salisbury & Van Voorhis, 2009; Bowles, DeHart, & Webb, 2012). Richard Nixon's 1971 emphasis on The War on Drugs, and the subsequent structured sentencing that was spawned from the criminalization of illicit substances is cited as a contributing factor to the increases seen in both male and female populations, with the limitation to judicial discretion being cited as the most salient factor related to increases in female incarcerated populations (Tripodi & Pettus-Davis, 2013). Researchers have argued that this policy has punished women disproportionately to the harm they have caused society (Bloom, Owen, & Covington, 2004). Women likewise face life circumstances in much greater proportions than males, such as sexual abuse, sexual assault, domestic violence, and being the primary caretaker of minor dependent children (Bloom, Owen, & Covington, 2004). These factors contribute to the gendered pathways literature highlighting female's paths to criminality stemming from abuse and poverty survival, as well as substance abuse (Bloom, Owen, & Covington, 2004). However, a more recently published longitudinal study investigating multiple competing theories of driving mechanisms to criminality in both males and females, found that for females, more substance use and offending behaviors in youth lead to more depressive

symptoms in early adulthood. This finding lends insight to the temporal ordering of internalizing symptoms and substance use in female offenders. These results contest the widely held perception that a female's path to criminality is driven by internalizing symptoms, when in fact the substance use and criminal behavior may be contributing to the increased rates of internalizing symptomology (Kim, Gilman, Kosterman, & Hill, 2018). Regardless of how females come to the attention of the criminal justice system, they are entering the detention facilities at increasing rates, face differing and complex life circumstances that contribute to their initial arrest and subsequent recidivism, have greater behavioral health needs than their male counterparts, and are still understudied in current research (Swavola, Riley, & Subramanian, 2016). However, in recent years, the study of Posttraumatic Stress Disorder and interpersonal victimizations within incarcerated populations, especially incarcerated female populations, has garnered considerable attention.

### **Posttraumatic Stress Disorder**

Research has highlighted the fact that for women, interpersonal victimization has emerged in the literature as a major contributor to both women being incarcerated and the high levels of mental health concerns reported by these individuals (Karlsson, Zielinski, & Bridges, 2015). Research has also indicated a "dose-response" within incarcerated populations, with those women that experience more incidences of traumatic experiences, from both family dysfunction and interpersonal violence, being more likely to be diagnosed with PTSD (Green, et al., 2016). The rates of childhood sexual victimizations reported by incarcerated women are also disproportionately higher than the general population, with research samples reporting 43-65% of sampled women in confinement facilities reporting childhood sexual abuse (CSA) (Karlsson, Zielinski, & Bridges, 2015), compared to 25% in a community sample meta-analysis (Pereda,

Guilera, Forns, & Gomez-Benito, 2009). CSA has also been cited as being the most likely trauma to result in posttraumatic stress disorder, as well as being linked to a number of other psychological disorders including depression, anxiety, and SUD, which are all seen in alarmingly high rates in this population (Karlsson, Zielinski, & Bridges, 2015). Although the links between sexual victimization, PTSD, SUD, and other psychological disorders may be multidirectional, it has been suggested that sexual victimization tends to precede the other issues (Karlsson, Zielinski, & Bridges, 2015). There may be a differential effect of outcome based on type of abuse experienced, with one study finding that CSA was associated with mental health problems in adulthood, but not substance use, and physical abuse in childhood was associated with substance use, but not mental health problems in adulthood, in a sample of incarcerated females (Tripodi & Pettus-Davis, 2013). However, a more recent study investigating negative substance use outcomes based on type of childhood adversity, found that CSA increased substance use risks for women, but not for men in prison populations (Marotta, 2017). Emerging evidence has suggested that for female offenders, mental health may mediate the relationship between victimization and offending, with greater frequency of both childhood and adult victimizations contributing to poorer lifetime mental health, and worse mental health and substance use contributing to offending (Lynch S. M., et al., 2017; Salisbury & Van Voorhis, 2009). Similarly, regardless of gender, experiencing sexual assault is strongly associated with greater severity of PTSD symptoms, which is then associated with heavy drinking and drug use, among individuals with mental illnesses involved in the criminal justice system (Cusack, Herring, & Steadman, 2013). Subsequently, having a diagnosis of PTSD increases a person's risk of recidivism at rates comparable to those with only a Substance Use Disorder, which is also comparable to the rates of recidivism in those with comorbid SUD and PTSD. This indicates that there may be relatively



similar risk factors among the three groups, compared to their incarcerated peers without either disorder (Sadeh & McNiel, 2015). A PTSD diagnosis maintains significant predictability of new felony arrests; however, even when controlling for substance abuse/dependence, indicating that PTSD is an important risk factor, independent of substance abuse and dependence (Sadeh & McNiel, 2015). Correspondingly, PTSD symptoms have also been associated with increased methamphetamine use and injection drug use (Staton-Tindall, et al., 2015).

### **Methamphetamine and Opioid Use**

Substance use in incarcerated populations is also a norm rather than an exception. According to the 2013 Arrestee Drug Abuse Monitoring (ADAM) program, more than 60% of all arrestees across all five geographically distributed large metropolitan jail sites tested positive for an illicit substance in their system. Depending on the site, anywhere from 12-50% of those people had more than one substance in their system (Office of National Drug Control Policy, 2014). Even in a local jail sample, the vast majority of the sample of current arrestees (87%) had at least one substance use disorder based on current diagnostic criteria (Proctor, Hoffmann, & Raggio, 2018). This appears to be especially so for females, as a large sample of women in jails, in multiple different regions across the country, indicated a startling 82% had experienced substance abuse or dependence in their lifetime (Swavola, Riley, & Subramanian, 2016). A meta-regression analysis of prevalence rates of drug and alcohol use disorders in entering prisoners from 1966-2015, indicated that entering female prisoners had a significantly higher prevalence of drug use disorder than men (Fazel, Yoon, & Hayes, 2017). However, startling, the broad category of substance use disorder is very heterogeneous, with each substance class having its own behavioral, criminogenic, and treatment implications; thus, treating SUD as a unitary construct may obscure important between group differences (Simpson, Rise, Brown, Lehavot, &

Kaysen, 2019). Research has also indicated that substance use frequency and number of substance use problems, may be stronger predictors of recidivism than a simple dichotomous presence or absence of an abuse/dependence (DSM-IV-TR) or SUD (DSM-5) diagnosis (Dacosta-Sanchez, Fernandez-Calderon, Gonzalez-Ponce, Diaz-Batanero, & Lozano, 2019; Scott, Grella, Dennis, & Funk, 2014).

The national conversation regarding substance use in recent years has largely focused on the opioid epidemic, which was declared a national health emergency in October of 2017 (The Lancet, 2018). This focus is warranted, given that 67.8% of the 70,237 drug overdose deaths in the United States in 2017 involved an opiate (Scholl, Seth, Kariisa, Wilson, & Baldwin, 2019). However, this focus on opioids distracts from the larger issue of use and overdose across drug classes (The Lancet, 2018), and it also largely ignores the fact of polysubstance use (Ellis, Kasper, & Cicero, 2018; Palamar, Le, & Mateu-Gelabert, 2018). Interestingly, nearly three fourths (72.7%) of cocaine-involved deaths and more than half (50.4%) of psychostimulant-involved overdose deaths in 2017 also involved an opiate (Kariisa, Scholl, Wilson, Seth, & Hoots, 2019). Conversely, this same pattern was not observed for psychostimulants, as the increases seen in psychostimulant deaths between 2010 and 2017 occurred largely independent of opioids (Kariisa, Scholl, Wilson, Seth, & Hoots, 2019). Although death rates involving cocaine and psychostimulants increased across demographic characteristics, the largest relative rate increase occurred among females aged 25-44 years, increasing 48% from 2016-2017 (Kariisa, Scholl, Wilson, Seth, & Hoots, 2019). Methamphetamine has become a complex global problem, ranking second to marijuana in terms of use, however, outdated information and data inconsistencies make it difficult to track trends nationally and internationally (Stoneberg, Shukla, & Magness, 2018; Degenhardt & Hall, 2012). Furthermore, the scarcity of quantitative estimates

of use make it difficult to ascertain the overall burden of disease illicit use of methamphetamines has on the community (Degenhardt & Hall, 2012). Burden of disease can be thought of as a measurement of the gap between the current health status and the ideal health status of living to an advanced age free of disease and disability, as measured by financial cost, morbidity, mortality, or other indicators (World Health Organization, 2020). The evidence that does exist underestimate the contribution of illicit drug use on the global burden of disease because they exclude the burden attributable to hepatitis B, hepatitis C, drug-violence, and other important public-health factors (Degenhardt & Hall, 2012). Although the risks of amphetamine use have not been as well studied as those of opioids, their use can lead to dependence, violence (Degenhardt & Hall, 2012), drug-induced psychosis (McKetin, 2018), HIV and hepatitis infections (Degenhardt & Hall, 2012), cardiovascular disease (Darke, Duflou, & Kaye, 2017), and those that use them are at increased risk for all-cause mortality (De Crescenzo, et al., 2018). Injection drug use accounts for more than half of the contribution of illicit drugs to disease burden (Degenhardt & Hall, 2012).

Opiates and methamphetamine are the two most commonly used substances for injection drug use (Office of National Drug Control Policy, 2014), and injection of these substances are associated with the highest rates of comorbid psychopathology (Darke, Torok, McKetin, Kaye, & Ross, 2011). Similarly, those that report injecting substances also reported higher prevalence of a range of childhood adversities (Marotta, 2017). There are well documented health risks involved in injection drug use (Larney, Peacock, Mathers, Hickman, & Degenhardt, 2017), with evidence suggesting that female injection drug users are at an even higher risk for some negative health outcomes, significantly more than their male peers (Wurcel, et al., 2018). Moreover, the overall face of drug use is changing in recent decades, as it is no longer primarily seen in young minority

males living in urban areas, and increasingly being seen in older white men and women living in less urban areas (Cicero, Ellis, Surratt, & Kurtz, 2014). Evidence also suggests that as many as three-quarters of rural women in a jail sample had ever injected drugs in their life-time and two-thirds reported recent injecting (Staton-Tindall, et al., 2015). What is also largely ignored in the media and empirical literature regarding injection drug use, is the prevalence and effects of polysubstance use and common combinations (Al-Tayyib, Koester, Langegger, & Raville, 2017; Pilowsky, et al., 2011). One of the most popular combinations for injection drug users is the concurrent use of a psychomotor stimulant and an opiate, which goes by several street names based on region (e.g. “speedball”, “bombita”, “goofball”, “swirly” etc.) (Al-Tayyib, Koester, Langegger, & Raville, 2017; Trujillo, Smith, & Guaderrama, 2011). A large study conducted in Denver, Colorado of injection drug users revealed that 29.2% reported only injecting heroin, 20.8% reported only injecting methamphetamine, and 50% reported injecting both substances within the past 12 months (Al-Tayyib, Koester, Langegger, & Raville, 2017). In treatment seeking opioid dependent adults, the combination of amphetamine and opioid use resulted in greater levels of medical and psychiatric morbidity than their opioid treatment seeking peers who did not use amphetamines (Pilowsky, et al., 2011). Based on the surge in methamphetamine use and polysubstance use in recent years (Al-Tayyib, Koester, Langegger, & Raville, 2017; Ellis, Kasper, & Cicero, 2018), the prevalence of injection drug users among female inmates in a jail settings (Staton-Tindall, et al., 2015; Staton, et al., 2018), and the multiplex impact of the convergence of multiple pandemics in jail systems, which have serious implications for the broader communities they will eventually return to (Trotter, et al., 2018), it is essential to establish current and accurate prevalence rates of the use and injection of these substances. It is likewise pertinent to explore negative outcomes, such as recidivism and investigate the

relationships between the use and injection of these substances with other high rate comorbidities in this population.

### **Depression and other Psychopathologies**

Depression is the most prevalent mental health concern in incarcerated populations, but is seen in substantially higher rates in females in jail facilities (Bronson & Berzofsky, 2017; Lynch S. M., et al., 2014; Steadman, Osher, Robbins, Case, & Samuels, 2009). One sample of incarcerated females in a unified prison and jail facility reported rates of depression in females as high as 83%, excluding those who only had depressive symptoms while incarcerated and not during follow-up interviews (Shuford, Gjelsvik, Clarke, & van den Berg, 2018). Depression reduces the likelihood of incarcerated female's recovery from substance use disorder, as studies of incarcerated populations have found that depressive symptoms strongly predict substance use treatment dropout and poorer addiction treatment outcomes (Johnson & Zlotnick, 2012). There are conflicting data among the current body of literature regarding depression's role in recidivism among incarcerated populations. One large statewide study on prison inmates in Texas found that depression increased the risk of having multiple incarcerations when compared to prisoners without any psychiatric disorders (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009), yet another study in Kentucky found that when comparing rural recidivists with rural non-recidivist, symptoms of depression did not vary significantly between the two groups (Webster, Dickson, Stanton-Tindall, & Leukefeld, 2015). However, the Kentucky study also noted that overall, rural participants had higher rates of all mental health problems (Webster, Dickson, Stanton-Tindall, & Leukefeld, 2015). In a large urban county jail study investigating predictors of recidivism in female offenders, they found that none of the mental health or trauma variables were predictive of recidivism (Scott, Grella, Dennis, & Funk, 2014). Surprisingly their

sample had a relatively low prevalence of Axis I disorders, reporting 45% (Scott, Grella, Dennis, & Funk, 2014), compared to other studies that have reported prevalence rates of depression of 80% or more in female incarcerated populations (Shuford, Gjelsvik, Clarke, & van den Berg, 2018; Staton-Tindall, et al., 2015). A longitudinal community study provides strong empirical evidence that the link between depression and criminality in females may be driven by delinquency and substance use at a young age. This study indicates that delinquency and substance use in youth contributes to criminal behavior and more depressive symptoms in early adulthood (Kim, Gilman, Kosterman, & Hill, 2018). Clearly depression has a link with criminality, but the exact strength and mechanism of that link as a predictor of recidivism has not been clearly defined, and warrants further investigation.

Bipolar disorder is also seen in high rates in incarcerated populations (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009; Binswanger, et al., 2010; Bronson & Berzofsky, 2017; Lynch S. M., et al., 2014; Steadman, Osher, Robbins, Case, & Samuels, 2009) compared to clinical samples (Hunt, Malhi, Cleary, Lai, & Sitharthan, 2016). This highlights that the risk of violent criminal acts is higher among people with bipolar disorder (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009), and that risk is heightened when they also have a comorbid substance use disorder (Fovet, et al., 2015; Fazel, Lichtenstein, Grann, Goodwin, & Langstrom, 2010). Some evidence suggests that mania is more strongly related to substance use disorders than any other mood or anxiety disorder (Grant, et al., 2004). Interestingly, women with bipolar disorder have a higher risk of committing violent offenses than women in the general population (Fazel, Lichtenstein, Grann, Goodwin, & Langstrom, 2010). Consequently, women with comorbid SUD and bipolar are more likely to be arrested for violent or substance use charges compared to men with the same comorbid disorders (McDermott, Quanbeck, & Frye, 2007).

However, one small community sample confirmed that subjects with bipolar disorder that had criminal histories, had a recurrent course of illness, with predominately manic episodes, had an increased probability of substance use disorders. Yet, their analysis found that when considering antisocial personality disorder symptoms, manic episodes, and impulsivity measures, substance use no longer significantly contributed to a history of conviction (Swann, et al., 2011). This could indicate that the link between bipolar disorder and offending may be associated with impulsivity and antisocial personality disorder symptomology, but regardless, bipolar disorder or manic symptomology is an important consideration for female offending.

Antisocial personality disorder (ASPD) is defined as a pervasive pattern of disregard for and violation of the rights of others (American Psychiatric Association, 2013). There has been considerable and consistent documentation of the high prevalence of this disorder within incarcerated populations (Guston, Combs, Kopak, Raggio, & Hoffmann, 2018; Lanza, Garcia, Lamelas, & Gonzalez-Menendez, 2014; Proctor & Hoffmann, 2012; Raggio, Hoffmann, & Kopak, 2017; Zlotnick, et al., 2008). Although the rates of ASPD in men are substantially higher than in women in the general population (American Psychiatric Association, 2013), the gender difference is less pronounced in incarcerated populations (Black, Gunter, Lovelss, Allen, & Sieleni, 2010; Dolan & Vollm, 2009; Lewis, 2010; Lewis, 2011; Warren, et al., 2002). The association between ASPD, violence, offending, and criminality has been well established within male samples (Fovet, et al., 2015; Ogloff, Talevski, Lemphers, Wood, & Simmons, 2015), but far less is understood about this link in females (Lewis, 2010; Lewis, 2011; Logan & Blackburn, 2009). Conduct Disorder (CD), a prerequisite criterion for ASPD (American Psychiatric Association, 2013), is also important when considering recidivism and continued criminal engagement (Edens, Kelley, Lilienfeld, Skeem, & Douglas, 2015). Men and women additionally

differ in their presentations of both CD and ASPD (Alegria, et al., 2013; Compton, Conway, Stinson, Colliver, & Grant, 2005; Sher, et al., 2015; Warren & South, 2009). Antisocial girls have a later onset of childhood conduct problems and are less likely to engage in aggressive acts (Dolan & Vollm, 2009). In a large national sample, comparing antisocial behaviors between men and women with ASPD, women were more likely than men to have run away from home overnight, missed work/school, lied a lot, forged someone's signature, gotten into a fight that came to swapping blows with an intimate partner, and harassed/threatened/blackmailed someone (Alegria, et al., 2013). Conversely, women with ASPD were less likely than men with ASPD to have done something that could have easily hurt them or others, destroyed other's property, started a fire on purpose, done something they could have been arrested for, hit someone so hard they injured them, and hurt an animal on purpose (Alegria, et al., 2013). In a large sample of women in a maximum security prison, an inability to conform to social norms, impulsivity or failure to plan ahead, impulsivity related to behavior that is self-damaging, and irritability and aggressiveness were the symptoms endorsed by more than 50% of the entire sample, and greater than three quarters of the individuals who met criteria for ASPD (Warren & South, 2009). Overall, men and women endorse the same mean number of criteria for ASPD, however, the pattern of behaviors and symptoms differs significantly by sex (Alegria, et al., 2013; Warren & South, 2009), with men with ASPD displaying more illegal and violent behavior patterns than women, indicating a more severe presentation in men (Alegria, et al., 2013). ASPD is a heterogeneous, multidimensional disorder, which makes predictive research complicated (Whipp, et al., 2019). Even though antisocial girls develop symptoms later than males (Sher, et al., 2015), one consistent finding is the relationship between CD and violent offending in women (Lewis, 2010), with childhood symptom counts of conduct disorder being the only facet of ASPD



to demonstrate any predictive utility of institutional misconduct in a large prison study (Edens, Kelley, Lilienfeld, Skeem, & Douglas, 2015). This suggests that historical information regarding prior childhood conduct is a salient component in predicting institutional adjustment (Edens, Kelley, Lilienfeld, Skeem, & Douglas, 2015), and the fact that CD is correlated with violent offending in females convicted of a felony (Lewis, 2010), indicate that the presence or severity of CD in female detainees may be a predictive risk factor for continued recidivism.

Panic disorder, marked by recurrent periods of intense fear or discomfort in the absence of any cue or trigger (American Psychiatric Association, 2013), is similarly seen in high rates in incarcerated populations (Guston, Combs, Kopak, Raggio, & Hoffmann, 2018; Stuart, Moore, Gordon, Ramsey, & Kahler, 2006). In a sample of violent women in secure settings, panic disorder, present in approximately 31% of the total sample, significantly co-occurred with PTSD (Logan & Blackburn, 2009). Panic disorder has also been linked to heightened threat response, to both predictable and unpredictable threat stimuli (Shankman, et al., 2013), and individuals with panic disorder are susceptible to elevated anger and aggression (Cassello-Robbins, et al., 2015). Panic disorder has garnered little attention in the research of incarcerated populations, however, the significant co-occurrence with PTSD (Logan & Blackburn, 2009), heightened threat response (Shankman, et al., 2013), and aggression (Cassello-Robbins, et al., 2015), would indicate a propensity toward violent behavior that would likely come to the attention of law enforcement. Indication of a possible panic disorder would likewise be prudent to identify in incarcerated populations, as elevated anger and aggression that develops in the context of the disorder, differs from trait anger, and tends to remit when the disorder is treated (Cassello-Robbins, et al., 2015). It is likely that if panic disorder is linked to recidivism, that offending behavior would remit with treatment as well.

## **Comorbidity**

Incarcerated women not only have higher rates of mental health disorders, they also experience higher rates of comorbidity (Al-Rousan, Rubenstein, Sieleni, Deol, & Wallace, 2017; Logan & Blackburn, 2009; Lynch S. M., et al., 2014; Zettler, 2018). Much of the research on co-occurring disorders has looked at the co-occurrence of substance use disorders and other serious mental illnesses such as depression, bipolar, and schizophrenia-spectrum disorders, or PTSD (Sacks, 2004; Wood, 2012; Young, 2003). This research has determined that mental illness alone does not predict recidivism, it is the co-occurrence of mental illness and substance use that accounts for recidivism, with substance use disorders accounting for the majority of that relationship (Wilson & Wood, 2014). However, this research has also lumped mental health disorders and substance use disorders into unitary constructs (Houser & Welsh, 2014; Wilton & Stewart, 2017), which may obscure important differences within presentations. The person with major depression and co-occurring marijuana use disorder is likely going to have different behavioral and criminogenic characteristics than the person with primarily manic episodes that injects stimulants. Conversely, other research has supported that there is a significant reinforcing interaction between co-occurring mental health disorders and substance abuse, such that as each increase, so does the likelihood for recidivism. However, the mental disorders component has a stronger effect than the effect of substance abuse (Carkin & Tracy, 2018). Studies of comorbidity in incarcerated populations have largely overlooked personality disorders as well, with one study indicating that participants with co-occurring mental illness, substance use disorder, and an additional antisocial personality disorder were responsible for more frequent and serious offending than those with mental illness alone (Ogloff, Talevski, Lemphers, Wood, & Simmons, 2015). One study in the UK found that violent women in prison and forensic hospital settings all

had at least one Axis I diagnosis (e.g. mood disorders, psychotic disorders, alcohol and substance abuse/dependence disorders, anxiety disorders including posttraumatic stress disorder, panic disorder, and OCD), with an average of 3.94 lifetime and/or current diagnoses (Logan & Blackburn, 2009). More than 90% of this sample met criteria for two or more Axis I diagnoses, and 69% met criteria for 3 or more diagnoses (Logan & Blackburn, 2009). They also looked at personality disorders in this sample, documenting that 82% were given a diagnosis of one or more personality disorders, with 61% of the entire sample having 2 or more personality disorder diagnoses and 35% having 3 or more (Logan & Blackburn, 2009). Lynch et al. 2014, also documented a high rate of comorbid disorders among female jail inmates, however, their investigation only included serious mental illness (defined as major depressive disorder, bipolar disorder, and schizophrenia spectrum disorder), PTSD, and substance use disorders, of which all substances were grouped together as one construct. An exploratory study of comorbidity among female detainees in drug treatment in Chicago, Illinois embraced the dimensional approach to psychiatric diagnoses by clustering disorders into internalizing and externalizing disorders (Scott, Dennis, & Lurigio, 2015). Scott and colleagues (2015) cite that clusters of co-occurring SUDs and other psychiatric disorders in the area of forensic risk assessment can be used as variables in tools for predicting recidivism. Their sample was a drug treatment program, thus 70% had a diagnosis of abuse or dependence, but all were misusing substances, in addition 34% had one internalizing or externalizing disorder, 42% had both internalizing and externalizing disorders, and 24% had only a substance use disorder. They were not able to find enough participants with only an externalizing disorder to make a large enough group for comparison. Their analysis revealed that as comorbidity increased, so too did reported histories of criminal activities, trauma exposure, drug use severity, and mean scores on a multi-faceted measure of

criminal thinking (Scott, Dennis, & Lurigio, 2015). In another study on Iraq/Afghanistan-era veterans, they took a factor analytic approach to common psychiatric comorbidities to explore its relationship to violence, incarceration, and suicidal ideation. They found that compared to the internalizing-externalizing 2-factor model, a 3-factor model fit the data best. The three higher-order factors include an externalizing/substance use disorder (SUD) factor, a distress factor, and a fear factor. Alcohol use disorders, substance use disorders, and nicotine dependence loaded onto the externalizing-SUD factor, PTSD and depression loaded onto the distress factor, and Panic disorder, social and specific phobias, and OCD loaded on the fear factor. Although it was not measured in their study the authors mention that antisocial personality disorder has loaded on the externalizing-SUD factor in other studies. Incarceration was exclusively predicted by the externalizing-SUD factor, and difficulty controlling violence was exclusively predicted by the distress factor (Kimbrel, et al., 2014). With this in mind, it clearly would be beneficial to explore clusters of co-occurring disorders to further elucidate the connections between mental illness, SUDs, and recidivism.

### **Negative Outcomes**

Jails present very unique environments, where individuals facing incarceration will encounter potential exposure to infectious diseases, difficult access to treatment for chronic medical and mental health conditions, and experience a disruption in continuity of care, as well as other life disruptions (Trotter, et al., 2018). Incarceration has been shown to be detrimental to romantic relationships, as it precipitates immediate and consistent disruptions in cohabitating partnerships, and it also serves as a long-term impediment to the transition to marriage (Apel, 2016). Release from jail also has its risks, as the time frame immediately following release has an increased mortality risk. Although overdose deaths rank at the top of the list for cause of death

after release from jail, other causes include chronic disease, assaultive trauma, and other trauma from unintentional injury, suicide, and unspecified events (Alex, et al., 2017). Those individuals with serious mental illness leaving jail are also participating in community activities significantly less than a general community sample, further increasing their social isolation upon release (Wilson, Barrenger, Brusilovskiy, Draine, & Salzer, 2017). There is also emerging evidence that incarceration can be traumatic, and that long-term incarceration can result in a clinical subtype of PTSD (Liem & Kunst, 2013). One recent study in women who use drugs in California, documented that individuals who had gone to jail 6 or more times in their adulthood, labeled as high frequency of jail incarcerations, reported significantly higher levels of homelessness, feeling unsafe in their living environment, stress, poor mental health, and unmet mental and physical health needs, versus women with low frequencies of jail incarcerations (Lambdin, Comfort, Kral, & Lorvick, 2018). According to the 2013 Arrestee Drug Abuse Monitoring (ADAM) program, more than 80% of arrestees reported prior arrests, with nearly 30% in some places reporting having two or more arrests within the past year, which is a significant increase in the proportion of inmates with a criminal history, as well as a marked increase in the proportion of inmates with recent repeat arrests since 2003 (Office of National Drug Control Policy, 2014). So, not only are more people being incarcerated, but more people are going to jail multiple times in their lifetime. Incarceration has impacts beyond the scope of the criminal justice system that can have long lasting effects on an individual, warranting the ongoing inquiry into risks of arrest and recidivism.

Women have different pathways to jail than their male counterparts, but there is conflicting evidence on the driving mechanisms for observed gender differences. Trauma, victimization, and PTSD symptomology are highly prevalent in incarcerated female populations,

and their relationship with recidivism and injection drug use has yet to be fully elucidated. What is consistent in the literature is that substance use is the norm, rather than the exception in this population. Injection drug use, especially of substances such as methamphetamine and opioids, is linked to public health issues, as well as recidivism; however, the strength of substance use disorder's role in recidivism has had conflictual findings (Carkin & Tracy, 2018). Differentiating by substance type, frequency of use, and number of problems associated with use, may help clarify some of the differing findings in the current research. The rising rates of methamphetamine use and trends in polysubstance use, have largely been ignored in the shadow of the current opioid crisis in the US. It is theorized that some women use substances as a way of self-medicating symptoms of psychopathology. Another factor that has been consistently supported in the research is that women detained in jails have higher rates of depressive, bipolar, posttraumatic stress, antisocial personality, conduct, and panic disorders than women in the general population. Other than ASPD, which has less severe gender differences in this population, these disorders are typically seen at higher rates in incarcerated females, than in incarcerated males. Many of these disorders have been linked to facets of recidivism in male populations, but have been severely under studied in female populations. Women also have more instances of comorbidity, which may contribute to recidivism seen in women. Yet the study of comorbidity and co-occurring substance use disorders have been limited due to the propensity to lump heterogeneous disorders and types of substance use disorders into univariate constructs that fail to illuminate important differences among each group. Considering the fact that women tend to experience greater negative outcomes from jail incarcerations, as well as the families that depend on them, the study of the contributions of specific substances, psychopathologies, and the

cumulative impact of comorbidity on factors of recidivism are not only appropriate, but necessary.

### **Purpose of Current Study**

The purpose of the current study is to elucidate the cumulative impact of PTSD, severe methamphetamine and/or opiate use disorder, with or without injection, and other psychopathologies on measures of recidivism for women recently incarcerated in a county jail. Based on the reviewed literature, the following hypotheses are made:

Hypothesis 1: Research has indicated that a PTSD diagnosis predicts new arrests, even when controlling for substance abuse/dependence. This indicates that PTSD is an important risk factor, independent of substance abuse and dependence (Sadeh & McNiel, 2015). However, much of the research investigating the link between PTSD and recidivism has been with large urban samples which include more males than females in the sample. Since incarcerated females have higher proportions of PTSD (Lynch, Fritch, & Heath, 2012), and rural populations have higher rates of mental illness (Webster, Dickson, Stanton-Tindall, & Leukefeld, 2015), it is hypothesized that with a sample of incarcerated women in rural areas, females with PTSD will recidivate more than incarcerated females without PTSD.

H1a: Female inmates who meet criteria for posttraumatic stress disorder are more likely to be previously booked into the jail in the past 12-months than females who do not meet criteria.

H1b: Female inmates who meet criteria for PTSD will be more likely to have multiple bookings in the past 12 months than females who do not meet criteria.

H1c: Female inmates who meet criteria for PTSD will have spent more days in jail than females who do not meet criteria.

Hypothesis 2: PTSD symptoms have also been associated with increased methamphetamine use and injection drug use (Staton-Tindall, et al., 2015). However, this link has garnered very little attention in the research. Considering the rise of methamphetamine use, the ongoing opioid crisis, and the burden of disease the injection of these substances places on society, any link to drug injection should be explored. It is hypothesized that female inmates who meet criteria for PTSD are more likely to use methamphetamine or opiates, and inject these substances than incarcerated females without PTSD.

H2a: Female inmates who meet criteria for PTSD are more likely to use methamphetamine or opiates than females who do not meet criteria.

H2b: Female inmates who meet criteria for PTSD are more likely to report drug injection than those who do not meet criteria.

Hypothesis 3: Research has also indicated that number of substance use problems, as indicated by severity level of SUD's, is a stronger predictor of recidivism than a dichotomous presence/absence of a substance use disorder, and ignoring drug class obscures important between group differences. Much of this research has also been conducted with male, or primarily male samples, making it difficult to generalize to female populations. It is hypothesized that incarcerated females with moderate to severe Amphetamine or Opioid Use Disorder will be more likely to recidivate, than incarcerated females without moderate to severe problems with these two substance classes.

H3a: Female inmates who meet criteria for moderate to severe Amphetamine or Opioid Use Disorder are more likely to be previously booked into the jail in the past 12-months than females who do not meet these criteria.



H3b: Female inmates who meet criteria for moderate to severe Amphetamine or Opioid Use Disorder are more likely to have multiple bookings in the last 12-months than females who do not meet these criteria.

H3c: Female inmates who meet criteria for moderate to severe Amphetamine or Opioid Use Disorder will have spent more days in jail than females who do not meet these criteria.

Hypothesis 4: Evidence also suggests that as many as three-quarters of rural women in a jail sample have injected drugs in their life-time and two-thirds reported recent injecting (Staton-Tindall, et al., 2015). Injection drug use has been strongly linked to recidivism in incarcerated male populations, and few studies have been conducted investigating this link with incarcerated females. Much like their male counterparts, it is hypothesized that females that report injection drug use will be more likely to recidivate than females who do not report injection drug use.

H4a: Female inmates who report drug injection are more likely to previously be booked into the jail in the past 12-months than females who do not meet this criterion.

H4b: Female inmates who report drug injection are more likely to have multiple bookings in the last 12-months than females who do not meet this criterion.

H4c: Female inmates who report drug injection will have spent more days in jail than females who do not meet this criterion.

Hypothesis 5: One study conducted in Sydney, Australia found that injection of methamphetamine and opiates are associated with the highest rates of comorbid psychopathology (Darke, Torok, McKetin, Kaye, & Ross, 2011). The majority of that sample were males, however, female gender also consistently presented a strong link with comorbid psychopathology in the analyses used to explore this link in this sample of recruited injection drug users. Using an incarcerated female sample, it is hypothesized that methamphetamine and

opioid use will be linked to greater mental health comorbidity, however it is unknown if this link is more associated with the specific substances, or the endorsement of injection, so both hypotheses will be explored.

H5a: Female inmates who meet criteria for moderate to severe Amphetamine or Opioid Use Disorder are more likely to meet criteria for more than one comorbid disorder than those who do not meet these criteria.

H5b: Female inmates who inject Amphetamines or opioids are more likely to meet criteria for more than one comorbid disorder than those who do not meet these criteria.

Hypothesis 6: Women experience higher rates of multiple mental health disorders. Research has indicated that as comorbidity increases, so too does reported histories of criminal activities, and drug use severity in a jail-based substance use treatment sample of women (Scott, Dennis, & Lurigio, 2015). Studies of multiple comorbidities that include personality disorders, as well as studies investigating multiple comorbidities with and without substance use disorders, and their links to recidivism are rare. Those that do exist, tend to lump all substances into a unitary construct, which may be partially responsible for differences seen in the literature in regards to which construct, mental illness or substance use, is more strongly associated with recidivism when they are explored in conjunction. It is hypothesized that women that experience multiple comorbid mental health disorders will be more likely to recidivate. It is further hypothesized that those women who have the most severe substance use disorders (defined as moderate to severe Amphetamine or Opioid Use Disorder or reported current injection drug use), in combination with multiple mental health disorders, will be more likely to recidivate than women who do not meet these criteria.

H6a: Female inmates who meet criteria for more than one mental health disorder are more likely to previously be booked into the jail in the past 12-months compared to females with none or one disorder.

H6b: Female inmates who meet criteria for more than one mental health disorder are more likely to have multiple bookings in the last 12-months than females with none or one disorder.

H6c: Female inmates who meet criteria for more than one mental health disorder will have spent more days in jail than females with none or one disorder.

H6d: Female inmates who meet criteria for more than one mental health disorder and moderate to severe Amphetamine or Opioid Use Disorder are more likely to previously be booked into the jail in the previous 12-month period than females who do not meet these criteria.

H6e: Female inmates who meet criteria for more than one mental health disorder and moderate to severe Amphetamine or Opioid Use Disorder are more likely to have multiple bookings in the last 12-months than females who do not meet these criteria.

H6f: Female inmates who meet criteria for more than one mental health disorder and moderate to severe Amphetamine or Opioid Use Disorder will have spent more days in jail than females who do not meet these criteria.

H6g: Female inmates who meet criteria for more than one mental health disorder and inject will be more likely to previously be booked into the jail than females with none or one disorder.

H6h: Female inmates who meet criteria for more than one mental health disorder and inject will be more likely to have multiple bookings in the last 12 months than females with none or one disorder.

H6i: Female inmates who meet criteria for more than one mental health disorder and report drug injection will have spent more days in jail than females with none or one disorder.

## CHAPTER 3: METHODS

Data collection for this study was conducted in three county jails in predominately rural areas of western North Carolina. The data collection was occurring as a part of a larger study gathering comprehensive assessment data of behavioral health issues in rural county jails, with the first wave of data collection detailed elsewhere (Raggio, Hoffmann, & Kopak, 2017; Raggio, Kopak, & Hoffmann, 2017). The first wave of data collection occurred between December 2015 and November 2016 at the Haywood County Detention Center in Waynesville, North Carolina. A total of 283 (200 male, 83 female) interviews were conducted over the course of 82 site visits. Although data was collected for both male and female inmates, only information from female inmates will be used for the current study. A total of 167 females were interviewed, 83 from Haywood County Detention Center, 60 from Jackson County Detention Center, and 24 from Transylvania County Detention Center. The average age of participants was 33 (*SD*: 9.76, Min. 18, Max. 66). The majority of the sample classified their ethnicity as Caucasian (77.45%). The second most prevalent ethnicity was Native American (16.77%), followed by African American (3.59%), Hispanic/Latino (3.59%), and Asian (0.60%). Slightly less than thirty percent (29.94%) of the participants had less than a high school education and 76.65% report being unemployed. More than two-thirds (68.86%) of participants report a personal income of less than \$10,000 a year.

### **Procedure**

Data was collected from a random sample of adults booked into the three jails sampled. Participants were eligible for inclusion in the study if they had been booked into the facility within the preceding 24–96-hour time period, spoke English well enough to understand and sign

the informed consent form read by the interviewer, and were at least 18 years of age. Those booked within this period were divided by gender, then added to the day's eligibility list, which was later cut into pieces and placed into two envelopes. Inmate names were randomly selected from the female envelope first, and once those names were exhausted, names were randomly selected from the male envelope. Inmates were invited to participate in a study of behavioral health issues. Informed consent was obtained in accordance with the Institutional Review Board of the university to which the researcher is affiliated. Interviews were conducted by a researcher who is unaffiliated with the detention center to minimize the likelihood of response bias that has been found among inmates when they are interviewed by jail staff (Proctor, Hoffmann, & Corwin, 2011). All interviewers were trained in administration of the structured clinical interview by the instrument author. Two interviewers were Masters level graduate students, and one interviewer was a licensed mental health provider employed at a local community mental health center. Upon completion of the interview, inmates were thanked for their participation, debriefed on the medical inquiry process should they need to speak with the nurse, and returned to their cell by a detention officer. Inmates were not paid or compensated in any way for their participation in the study.

### **Instruments**

Clinical interviews were conducted utilizing the Comprehensive Addiction and Psychological Evaluation-5 (CAAPE-5), a structured interview covering substance use disorders and common mental health conditions (Hoffmann, 2013) compatible with the current version of the Diagnostic and Statistical Manual (DSM-5; American Psychiatric Association, 2013). The CAAPE-5 provides an assessment of SUDs for a number of substances, including alcohol, marijuana, cocaine, heroin, amphetamines, sedatives, hallucinogens, inhalants, and combinations

of substances. Depending on the number of positive findings, the interview can take between 25 and 35 minutes to complete. Inmates were interviewed in a secure but secluded area of the jail that is not subject to constant correctional staff traffic. This encouraged inmates to truthfully report their substance use history with minimal concern that jail staff would overhear the exchange of this information (Proctor, Hoffmann, & Corwin, 2011). The CAAPE-5 is efficient, and has been found to have acceptable agreement with other instruments, converges well with clinical determinations, and has been validated for use with jail inmates (Gallagher, Penn, Brooks, & Feldman, 2006; Proctor & Hoffmann, 2012).

The CAAPE-5 is designed so that demographic categories and responses to the clinical information can be readily coded as numeric values. These coded values were entered into IBM's SPSS Statistics software program (IBM Corp., 2013) where algorithms were developed to determine whether the diagnostic criteria for the various conditions were met in accordance with the designations provided in the DSM-5 (Raggio, Hoffmann, & Kopak, 2017). The diagnostic indications presented should be regarded as preliminary. Clinical determinations from the CAAPE-5 require a qualified clinician to evaluate whether any exclusion criteria apply or whether additional information beyond that in the CAAPE-5 substantiates a diagnosis. Since not every criterion for every condition is included in the CAAPE-5, it is possible that there could be some false negative indications. Although no instrument alone can "make" a diagnosis, the data can provide an indication of the probable prevalence of the conditions covered (Raggio, Hoffmann, & Kopak, 2017).

Internal consistency within the CAAPE-5 is acceptable across the various scales contained within the instrument. The subscales vary in terms of the number of items from 6 to 11, depending on the condition. Cronbach's alpha ranged from .71 (for obsessive compulsive

disorder) to .98 (for Opioid Use Disorder) (Raggio, Hoffmann, & Kopak, 2017). In terms of inter-item correlations, or how strongly each item is related to each other within a scale, the antisocial personality disorder scale has the lowest of any other scale assessed by the CAAPE-5, which is primarily due to the low threshold of diagnostic criteria for a diagnosis and the widely differing criteria (Proctor & Hoffmann, 2012). However, of all the personality disorders assessed by the CAAPE-5, antisocial personality disorder is the only one with sufficient number of items to determine severity level in conjunction with diagnosis (Proctor & Hoffmann, 2012). The CAAPE has also been determined to yield accurate and complete substance use diagnoses (Carkin & Tracy, 2018). The DSM-5 symptom criteria that is reflected in each mental health disorder and substance use disorder measured within the CAAPE-5 demonstrates the content validity of the instrument. The CAAPE-5's ability to quantify responses for determination of a diagnosis and capture two principal components of comorbidity (mental health and substance use disorders), demonstrate its construct validity (Carkin & Tracy, 2018). Recent evidence suggesting the CAAPE-5 measures to be significant, mutually reinforcing factors of criminal behavior, also support the predictive validity of the instrument for the study of recidivism (Carkin & Tracy, 2018). The CAAPE has also been compared with The Structured Clinical Interview for DSM-IV (SCID), which has widely been dubbed the "gold standard" of diagnostic interviews, and concordance has been calculated at 95% agreement (Gallagher, Penn, Brooks, & Feldman, 2006).

The final step in the data collection process involved gathering information related to criminal justice involvement from the jail records database. After interviews were completed, inmates' prior booking data was queried within the detention center's records management system. The information drawn from these records included whether or not the inmate was



previously processed into the jail in the past 12 months, the type (i.e., property, violent, drug related) of prior and current criminal charges, severity of criminal charges (i.e., misdemeanor or felony offense), number of days spent in jail, and the number of charges for which inmates were booked. These data were recorded onto extraction forms and matched with inmates' responses obtained from the CAAPE-5 assessments for further analyses.

## CHAPTER 4: RESULTS

### **Analyses**

All analyses were conducted using Stata software (StataCorp, 2019). In the first step of the analytic approach, descriptive statistics were generated to summarize the final study sample. Analyses for hypotheses involving binary categorical variables were assessed using a chi-squared test of independence to determine statistically significant differences. Hypotheses utilizing continuous dependent variables, such as number of days in jail, were examined using an independent means *t*-test to assess significant differences in length of time spent in the jail. For analyses involving more than two independent variables and a continuous dependent variable, a two-way analysis of variance (ANOVA) was used to determine significant differences between groups. Multivariate logistic regression models were used to further assess significant relationships, and common comorbid combinations, while accounting for the possible confounding influence of demographic background factors known to be associated with SUDs and jail admission (Kopak, Proctor, & Hoffmann, 2017).

**Independent Variables.** Diagnostic designations were converted to binary categorial variables based on if the participant endorsed enough criteria, based on current diagnostic determinants of the DSM (American Psychiatric Association, 2013), to be classified as having the sufficient number of symptoms associated with a specified diagnosis. Substance Use Disorder distributions based on severity level displayed bimodal distributions. The majority of the sample that would qualify for a specific SUD would be classified as moderate or severe and most others had no symptoms of SUD, with very few participants that would classify as having a mild SUD. Therefore, the binary categorizations of SUDs were moderate-to-severe (yes/no), with the few mild classifications being considered as no diagnosis. Two different binary injection

variables were used in analyses, one was coded based on endorsement of ever injecting a substance (yes/no), and the other was coded based on endorsement of injecting three or more times in the last twelve months (yes/no). Categories for comorbidities were created based on if the participant did not endorse enough symptoms to qualify for any diagnosis, only endorsed symptoms consisted with one mental health diagnosis, or endorsed enough symptoms to potentially have two or more mental health diagnoses.

**Dependent Variables.** Outcome or dependent variables were either recidivism variables or the same variables used in other analyses as independent variables. Recidivism variables were either a binary categorization of having been previously booked into the same facility within the preceding 12-months (yes/no), or having multiple bookings (yes/no), as defined as two or more bookings in the same facility within the 12-months prior to interview. The number of days spent in jail was maintained as a continuous variable for use in the independent sample *t*-test analyses.

## **Results**

The most prevalent mental health concern observed within this sample of 167 female detainees was Major Depressive Episode (67%), followed by Posttraumatic Stress (59%), and Antisocial Personality Disorder (33.5%). The proportion of the other mental health concerns endorsed include, Panic Episode (33.5%), Manic Episode (33%), Obsessions/Compulsions (22%), and possible Indications of Psychosis (8%). With 85% of the sample endorsing sufficient criteria to indicate at least one mental health disorder, nearly 69% indicating at least two mental health disorders, and 50% indicating criteria for three or more mental health disorders, the majority of the sample reported symptoms consistent with an array of mental health conditions. Overall, female detainees reported an average of two-and-a-half ( $M = 2.56$ ;  $SD = 1.76$ ) mental health conditions.

In regards to Substance Use Disorders (SUDs), approximately 75% of the sample met criteria for at least one substance use disorder based on the DSM-5 diagnostic criteria (American Psychiatric Association, 2013). The average number of potential moderate to severe SUDs observed within the sample is greater than one ( $M = 1.22$ ;  $SD = 1.00$ ). The most prevalent specific substance use disorder in the moderate to severe range is Amphetamine Use Disorder (62%), followed by Opioid (37%), Alcohol (24%), Marijuana (18%), and Cocaine (10%). Approximately 59% of the sample endorsed having ever injected substances, and 70% of those who endorsed injecting also endorsed injecting repeatedly within the last 12-months.

The analyses of the official recidivism records revealed that 61% of the female inmates that were interviewed had been booked at least once in the previous 12-months, with 33% booked two or more times, and 39% whom had not been booked at all in the last 12-months. This distinction in recidivism was used to differentiate between one time recidivists and potential frequent utilizers that cycle in and out of jails. The average length of stay was 17.57 days (28.46 SD) for the booking at time of interview for the combined female sample. However, analysis of the three different jail sites indicate a different average length of stay per facility, with Haywood County data having the longest average length of stay (Mean: 24 days, SD: 34, N=83), followed by Transylvania County (Mean: 13 days, SD: 18, N=24), and Jackson County having the shortest average length of stay (Mean: 10 days, SD: 21, N=60).

The chi-square analyses for Hypotheses 1a and 1b revealed no significant difference between those who meet criteria for a possible diagnosis of Posttraumatic Stress Disorder (PTSD) and those who do not meet these criteria, in their likelihood to have been booked in the last 12-months ( $\chi^2 (1) = 0.40, p = .53$ ), or to have been booked multiple times in that same timeframe ( $\chi^2 (2) = 1.34, p = .51$ ). The independent means *t*-test used for hypothesis 1c also

revealed that those who meet criteria for PTSD are not spending any more days in jail than other females ( $t(165) = 0.08, p = .93$ ). This indicates that females who endorse symptoms of PTSD are not more likely to have been booked into the same facility within the last 12-months, either once or multiple times, and they are not spending any more or less time in jail than any other female on average.

The chi-square analyses for hypothesis 2a revealed differential results based on substance. Female detainees who meet criteria for PTSD are significantly more likely to also meet criteria for moderate to severe Amphetamine Use Disorder ( $\chi^2(1) = 8.39, p = .004$ ), but they are not more likely to meet criteria for a moderate to severe Opioid Use Disorder ( $\chi^2(1) = 0.01, p = .936$ ). The chi-square analyses of hypothesis 2b also revealed interesting results. When female detainees who meet criteria for PTSD were compared against those who do not meet these criteria for endorsing ever having injected a substance, there were no statistically significant differences between the two groups ( $\chi^2(1) = 1.56, p = .212$ ). Post hoc analyses comparing those meeting and not meeting PTSD criteria with repeated injection (3 or more times) in the last 12-months approached significance ( $\chi^2(1) = 3.80, p = .051$ ), revealing female detainees that meet criteria for PTSD are potentially more likely to have injected substances repeatedly in the last twelve months, but are not more likely to have ever injected a substance.

The chi-square analysis conducted for hypothesis 3a revealed no significant difference for those meeting criteria for Amphetamine ( $\chi^2(1) = 1.02, p = .313$ ), Opioid Use Disorder ( $\chi^2(1) = 0.002, p = .965$ ), or both disorders ( $\chi^2(1) = 0.49, p = .48$ ) in the likelihood to have been booked into the same facility within the preceding 12-months. However, when the analyses were conducted to determine if there was a significant difference in being booked multiple times within the last 12-months, both indicators of moderate to severe amphetamine use ( $\chi^2(2) = 5.91$ ,

$p = .052$ ) and opioid use ( $\chi^2(2) = 5.79, p = .055$ ) approached significance. Conversely, those who meet criteria for both moderate to severe Amphetamine and moderate to severe Opioid Use Disorders are not more likely to have been booked multiple times in the last 12-months ( $\chi^2(2) = 2.08, p = .353$ ). This indicates that although having either an Amphetamine Use Disorder or an Opioid Use Disorder may be associated with multiple bookings, meeting criteria for the moderate to severe range with both substances does not, in this sample of female detainees. In regards to hypothesis 3c, those who met criteria for both Amphetamine and Opioid Use Disorders spent an average of 21.48 days in jail, versus the average of 16.08 days for those who did not meet criteria for both of these SUDs, however this was not a significant difference ( $t(165) = -1.10, p = .275$ ). Female detainees who meet criteria for a moderate to severe Amphetamine Use Disorder spent almost exactly the same amount of time in jail ( $M = 17.88$  days,  $SD = 26.70$ ) as those who did not meet these criteria ( $M = 17.06$  days,  $SD = 31.29$ ), ( $t(165) = -0.18, p = .857$ ). Females who met criteria for Opioid Use Disorder did spend more time in jail ( $M = 22.94$  days,  $SD = 35.45$ ) than the females who did not meet these criteria ( $M = 14.4$  days,  $SD = 22.98$ ), however, like those with both substance use disorders, this was not a significant difference either ( $t(165) = -1.88, p = .061$ ).

There were no significant differences found in the chi-square analysis for hypothesis 4a. Female inmates who endorse repeatedly injecting substances in the last year are not more likely to have been booked in the last 12-months, versus those who have not ( $\chi^2(1) = 0.99, p = .32$ ). However, they are significantly more likely to have been booked multiple times in the preceding 12-months ( $\chi^2(2) = 6.77, p = .034$ ), compared to those who have not. Conversely, females that report injecting repeatedly are not spending significantly more or less time in jail than those who do not ( $t(165) = -1.56, p = .120$ ).

The chi-square analyses used for hypothesis 5a also revealed some interesting differential results when considering the relationship of individual and polysubstance use with multiple comorbid disorders. Females that meet criteria for moderate to severe Amphetamine Use Disorder are significantly more likely to also meet criteria for more than one comorbid mental health disorder ( $\chi^2(2) = 11.05, p = .004$ ), with nearly 73% of those in the higher ranges of amphetamine use severity falling into this category. However, this relationship is not observed in those that meet criteria for the higher ranges of Opioid Use Disorder ( $\chi^2(2) = 0.59, p = .744$ ), or both disorders ( $\chi^2(2) = 2.11, p = .349$ ). Subsequently, the chi-square analysis for hypothesis 5b revealed no significant difference in females who report repeatedly injecting substances in the last year and those who have not on the likelihood of having multiple co-morbid disorders ( $\chi^2(2) = 0.34, p = .842$ ). This reveals that female detainees that meet criteria for moderate to severe amphetamine use are more likely to have multiple comorbid mental health disorders, but those who meet criteria for opioid use, simultaneous opioid and amphetamine use, or those who endorse current repeated injection, are not more likely to have multiple comorbid mental health disorders.

The chi-square analyses for hypotheses 6a and 6b indicated no significant difference between female detainees with multiple mental health disorders and those with one or none in their likelihood to be booked ( $\chi^2(2) = 3.65, p = .161$ ), or be booked multiple times in the previous 12-months from interview ( $\chi^2(4) = 5.91, p = .206$ ). The ANOVA analysis for hypothesis 6c also indicates there are no significant differences in the number of days women spend in jail ( $F(2, 164) = 0.14, p = .873$ ), although women with multiple mental health disorders do spend on average 2.33 more days in jail than women with zero or one mental health condition. Since results from hypothesis 5a indicated that only female detainees who meet criteria for moderate to

severe Amphetamine Use Disorder are more likely to have multiple mental health disorders, analyses for hypotheses 6d, 6e, and 6f, only looked at those with a moderate to severe Amphetamine Use Disorder and multiple mental health disorders endorsed, and not those with moderate to severe Opioid Use Disorder or meeting criteria for this classification with both substances. The chi-square tests used for hypotheses 6d and 6e determined there were no significant differences between those with a moderate to severe Amphetamine Use Disorder and multiple mental health concerns and those who do not meet these criteria in their likelihood to be booked ( $\chi^2(1) = 1.40, p = .237$ ), or their likelihood to be booked multiple times, in the preceding 12-months ( $\chi^2(2) = 1.09, p = .580$ ). The *t*-test used to test hypothesis 6f likewise indicated no significant difference in the number of days spent in jail ( $t(165) = -0.32, p = .751$ ) for those that meet criteria for a high range Amphetamine Use Disorder and more than one mental health disorder ( $M = 18.35$  days,  $SD = 26.72$ ), and those that do not meet these criteria ( $M = 16.93$  days,  $SD = 29.93$ ). The chi-square analyses used to evaluate hypotheses 6g and 6h revealed no significant differences between female detainees who meet criteria for more than one mental health disorder and endorse injecting substances and those who do not meet these criteria in their likelihood of being booked into the same facility, at all ( $\chi^2(1) = 2.99, p = .084$ ) or multiple times ( $\chi^2(2) = 1.67, p = .433$ ), in the previous 12-months. The *t*-test used to examine hypothesis 6i also determined there was no statistically significant difference in the number of days spent in jail ( $t(165) = -1.66, p = .099$ ) for those with multiple comorbid mental health disorders that have also injected substances ( $M = 23.38$  days,  $SD = 38.97$ ), and those that do not meet these criteria ( $M = 15.29, SD = 22.89$ ), even though the females that do meet these criteria spend 8 days longer, on average, in jail than those who do not meet these criteria.



Based on the bivariate associations observed among the female detainees who meet criteria for moderate to severe Amphetamine or Opioid Use Disorders, and those that reported repeatedly injecting substances in the previous 12-months, a series of binary logistic regression models were estimated to assess the associations between these drug use indicators and multiple jail admissions within the 12-months preceding interview, while controlling for age, racial and ethnic background, employment status, marital status, and education level. Out of the three binary logistic regression models estimated, investigating an Opioid Use Disorder indicator, an Amphetamine Use Disorder indicator, and endorsement of repeated injections, only one, amphetamine use, was statistically significant. Although the model for repeated injection was not significant, the variable of repeated injections was significant in predicting multiple bookings when controlling for the background factors, but there may be other variables not accounted for in this study that may be contributing to this relationship. The results from these analyses are presented in Table A1 and Table A2. Female detainees who met criteria for a moderate to severe Amphetamine Use Disorder are 2.57 times ( $OR = 2.57, CI = 1.23-5.39$ ) more likely to be booked multiple times within the same jail facility within the last 12-months compared to female detainees who did not indicate problems with amphetamine use. Even though indications of an Opioid Use Disorder approached significance, and endorsement of repeated injections was statistically significant, at the bivariate level, the apparent association between these two drug use indicators and the likelihood of being booked multiple times within the preceding year, did not maintain their significance when considering other background factors linked to recidivism.

## CHAPTER FIVE: DISCUSSION

This study contributes to the limited body of research on the rapidly growing female jail population. Although none of the indicators of mental health conditions or comorbid mental health conditions had significant relationship with recidivism, an intriguing finding from the current study is the relatively high prevalence of Amphetamine Use Disorder, and the relatively low prevalence of Opioid Use Disorder. This provides further evidence that drug use trends change rapidly and may be geographically specific. This is also why it is pertinent to have regular substance use and mental health assessments as a regular segment of the booking process to help classify and address the most salient mental health concerns within those being booked. These assessments also highlight and quantify the current need in the community to assist stakeholders in appropriate distribution of limited resources within small communities. The people with the highest need are not seeking out treatment for numerous reasons, so jail facilities serve as an ideal place to identify their most pressing mental health concerns as well as being a prime location for connecting disadvantaged people with the appropriate services available in the area.

The higher prevalence of Amphetamine Use Disorder versus Opioid Use Disorder in this sample is curious considering the continued focus on the opioid epidemic. This could support the notion that the work occurring to combat the current opioid crisis is potentially having an impact, but the exact mechanisms of this impact is unknown. It could be a natural evolution of preferences or drug use trends. Substance users may be turning to amphetamines as opioids get more difficult to find and amphetamines become more available. This finding could also be due to the prevalence of resources and treatment options available to those who have an Opioid Use

Disorder, whereas there are fewer options for those with Amphetamine Use Disorder aside from jail or incarceration. The behaviors of those with Opioid Use Disorder may be more likely to result in an overdose or hospitalization, whereas the behaviors of those with Amphetamine Use Disorder may be more socially problematic. Regardless of the reason or reasons for this trend, it is apparent that the opioid epidemic blinders need to be removed to allow attention and resources to be granted to other problematic substance use disorders.

The overarching theme hypothesized by the current study, of a cumulative impact of select substance use disorders (SUDs) and multiple comorbid mental health conditions on recidivism rates of females detained in rural jail facilities, was not fully supported. It appears that those females that are struggling with amphetamine-type substances or opioids and multiple symptoms of mental health concerns are not more likely to be booked in the preceding 12-months from interview, are not being booked more often, or spending any more time in jail than females who do not endorse the same large number of symptoms and concerns.

When looking at individual hypotheses tested, some results were contradictory to previous research. Hypothesis 1, which investigated recidivism in females who endorsed enough criteria to potentially be diagnosed with PTSD, versus those who did not endorse enough criteria to be considered to have a diagnosis of PTSD, found no significant differences between these two groups in the analyses of the measures of recidivism studied. This is inconsistent with the study conducted by Sadeh & McNeil (2015), which found that a PTSD diagnosis maintained significant predictability of new arrests in their large mixed gender study in a large urban jail (Sadeh & McNeil, 2015). This difference could be due to artifacts of gender differences in offending patterns, differences due to region, urban-rural distinctions, or other variables not considered in either study. This difference could also be due to the relatively high rate of PTSD

endorsed within this sample, which could contribute to a lack of variation. Gender differences however, could also be linked to the differences in symptom presentation, as there has been some evidence that males with PTSD tend to report higher rates of reckless and self-destructive behavior, whereas females report higher rates of emotional cue reactivity (Murphy, Elklit, Chen, Ghazali, & Shevlin, 2019). It is likely that masculinity and gender norms may inhibit males from seeking treatment for PTSD (Christiansen & Berke, 2020) and the higher reported reckless and self-destructive behavior may reach levels that come to the attention of law-enforcement during that time, which may contribute to the observed relationship as reported by Sadeh & McNeil (2015).

Hypothesis 2, which investigated the relationship of a potential PTSD diagnosis with the likelihood of also having a potential moderate to severe specific substance use disorder with Amphetamines or Opioids, found a significant relationship with amphetamines only. This indicates that female detainees who meet criteria for a probable PTSD diagnosis are significantly more likely to also have an Amphetamine Use Disorder, but they are not more likely to also have an Opioid Use Disorder. There is some emerging evidence that suggests that amphetamine treatment could potentially alter the emotional valence of a traumatic memory (Toledano & Gisquet-Verrier, 2014). It is possible that women with PTSD may unknowingly be self-medicating with amphetamines for symptoms, but this is mere speculation with such little evidence.

Another interesting finding from the analyses used to investigate these hypotheses was that female detainees that reached the level of a probable PTSD diagnosis may be more likely to endorse injecting substances multiple times in the last 12-months than women who did not reach this level of PTSD symptomology, however this relationship only approached statistical

significance. This lends some support to prior research that found a significant association between PTSD symptoms and increased methamphetamine and injection drug use among a sample of drug-using rural women in jail (Staton-Tindall, et al., 2015). This association with injection drug use may also be associated with a history of childhood traumas, as some researchers have found that as the prevalence of childhood traumatic experiences increase, so does risky behavior such as injection drug use and sex work (Wu, Schairer, Dellor, & Grella, 2010). There may be a stronger association for men with PTSD to endorse risky and self-destructive behavior, but this appears to be the case for females as well (Murphy, Elklit, Chen, Ghazali, & Shevlin, 2019).

Hypothesis 3 explored the relationship between moderate to severe amphetamine or Opioid Use Disorders and recidivism outcomes. There was no difference between those that met criteria for these substance use disorders in their likelihood to have been booked at all, but analyses that approached significance when looking at multiple bookings in the last 12-months, indicates there might be a relationship with those meeting criteria for either an Amphetamine Use Disorder or an Opioid Use Disorder being booked multiple times. Conversely, when the relationship of these substance use disorder indicators were assessed in the context of their odds of being booked multiple times, while controlling for various demographic factors, only an Amphetamine Use Disorder remained significantly associated with repeated bookings in a 12-month span. This may indicate that the continued focus on opioids, at the cost of ignoring other substances such as methamphetamine may be misguided. This trend could also be linked to the fact that behavioral presentations of individuals under the influence of amphetamine could be what is drawing the attention of law enforcement as officers try to judge, with little to no formal training, what is potential criminal or harmful behavior, and whether this is a manifestation of

substance induced intoxication or potential psychosis (Dodge, 2019). Other findings from this hypothesis set indicate that those that meet criteria for both substance use disorders are not more likely to be booked, or be booked multiple times, than those that do not meet this severity level for both amphetamines and opioids. Although women who meet criteria for Amphetamine Use Disorder are not spending any more time than anyone else in jail, those women that are meeting criteria for an Opioid Use Disorder or both an Amphetamine Use Disorder and an Opioid Use Disorder, are spending a few more days on average than others, even though this is not a statistically significant difference. Given that some women, with significant health concerns, are spending slightly more time in jail than others, this may be a prime opportunity to connect them with treatment both inside and outside the correctional facility.

Hypothesis 4 evaluated the relationship between repeated injections in the last 12-months and recidivism outcomes. Women who endorse repeatedly injecting substances within the last 12-month timeframe are significantly more likely to be booked multiple times in the preceding 12-months than women who have not repeatedly injected substance. However, this relationship did not remain significant with multiple bookings when controlling for various background factors, indicating that other variables may be responsible for this apparent association. These women are not spending any more time in jail than others, but they may be coming to jail more often. Female injection drug users may be coming to jail more often because of the lifestyle of being an injection drug user exposing them to more criminally involved people or environments, disconnection with familial and other prosocial supports, or it could be due to having partners. Some research has identified that this typically protective factor, of being in a committed relationship, is associated with more involvement in drug and property crimes for females, but not for males (Alarid, Burton, & Cullen, 2000). Injecting substances is linked to a plethora of

negative health outcomes, some of which include increased risk of contracting certain communicable diseases. In close quarters, like those within a jail facility, some of these communicable diseases, such as MRSA or the novel coronavirus, can spread rapidly to otherwise healthy inmates unlucky enough to be exposed to that environment. They may not be staying long, but there is a chance they can leave a lasting mark on those they come into contact within the jail context.

Hypothesis 5 investigated the relationship between drug use and multiple comorbid psychopathologies. As it turns out, females who meet criteria for a moderate to severe Amphetamine Use Disorder are more likely to have multiple comorbid mental health concerns. However, those who endorse repeatedly injecting substances in the last year are not more likely than those who do not inject, or have not injected more than 3 times in the past year, to have multiple comorbid mental health concerns. This is inconsistent with Darke et al.'s (2011) study that cited that those who inject substances have the highest rates of comorbid psychopathology. This could be due to the behavior precipitated by the substance itself and not by the injection of it, or it could be due to other factors that lead women to become dependent on a substance. This is supported by the post hoc analyses that revealed that 98% of those that met criteria for a moderate to severe Amphetamine or Opioid Use Disorder indicated they had ever used a substance to relieve emotional discomfort. This was significantly more than those who did not meet criteria for these disorders that endorsed the same item (84%), leading one to presume that these women may at least perceive that they may be using substances as a form of self-medication for emotional distress. If most females with a severe SUD are reporting use to relieve emotional discomfort, this may explain lack of statistical significance, because there was no variability to explain. The relationship between drug use and multiple comorbid

psychopathologies is not observed for those that meet criteria for a moderate to severe Opioid Use Disorder, or for those women who meet criteria for both substance use disorders. This confirms the notion that by combining all substances into a unitary construct, important between group differences can be missed in analyses.

Hypothesis 6, which aimed to serve as a cumulative hypothesis, building on all the other hypotheses, found no significant differences in any of the multiple comorbid psychopathology and substance use conditions. Females detained in jails do have significantly more drug and mental health problems than women in the general public, but based on the analyses from the current study, only a probable Amphetamine Use Disorder maintains any predictability of recidivism. Those women with an Amphetamine Use Disorder are also more likely to have multiple mental health concerns, which lends support to the notion that these women are also in need of more comprehensive behavioral health services beyond simple approaches focused solely on substance use.

There are a few important limitations to this study that should be highlighted. The most salient limitations would be the self-report methodology and rate of refusal to participate. Those posing the most threat to security which were determined by detention staff to be ineligible and those refusing due to reasons indicating no history of substance use or being in recovery from a substance use disorder may have introduced selection bias to the sample. Diagnostic indicators should also be interpreted with caution due to the use of a single assessment instrument and lack of verification from a qualified clinician. The study does provide some strength with the use of samples derived from multiple facilities, however, the close proximity of the sampled facilities limit the generalizability to the western region of a single state in the United States.



As it turns out, the evidence did not support the presence of a Trifecta Effect among this sample of female detainees. Other researcher (Roth, 2018; Wilson, Draine, Hadley, Metraux, & Evans, 2011; Zettler, 2018), also failed to detect a measurable association with recidivism outcomes, but this is part of a large set of mixed findings documenting associations between drug use indicators and recidivism (Denney & Connor, 2016; Scott, Grella, Dennis, & Funk, 2014; Staton-Tindall, Harp, Winston, Webster, & Pangburn, 2015; Webster, Dickson, Stanton-Tindall, & Leukefeld, 2015). One key result of the current study exemplifies the differential association between drug use and recidivism outcomes based on specific substances. Associations seen in prior findings may have been primarily driven by a prevalent substance which is preferred within the sample. In this study's sample, only Amphetamine Use Disorder had any association with recidivism, but it was also the only factor that had any significant association with multiple comorbid mental health conditions as well. Clearly identification of specific SUD's and severity are not only important for criminal justice risk assessment, but it is also important to identify and treat the other mental health symptoms in this vulnerable population as well. This endeavor will not only serve to reduce their reentry to the criminal justice system, but to also provide a link to resources that can provide a holistic approach to coping with and managing the plethora of difficulties faced on a regular basis, that go unrecognized and unaddressed, due to a variety of circumstances.

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APPENDIX A: TABLES

Table A1: Multivariate logistic regression results predicting multiple jail bookings in the preceding 12-months

Variable	$\beta$ (SE)	Wald's $\chi^2$	<i>p</i>	OR	95% CI	
					Lower	Upper
Age	-.05(.02)	4.83	.028	0.95	0.91	0.99
Non-white	-.26(.41)	0.39	.533	0.77	0.34	1.73
Less than HS education	-.40(.39)	1.04	.308	0.67	0.31	1.44
Unemployed	.45(.42)	1.13	.287	1.57	0.68	3.59
Never Married	-.44(.39)	1.27	.260	0.64	0.30	1.39
Mod.-Sev. Amphetamine Use	.94(.37)	6.36	.012	2.57	1.23	5.36

Table A2: Multivariate logistic regression results predicting multiple jail bookings in the preceding 12-months

Variable	$\beta$ (SE)	Wald's $\chi^2$	<i>p</i>	OR	95% CI	
					Lower	Upper
Age	-.04(.02)	3.19	.074	0.96	0.92	1.00
Non-white	-.32(.41)	0.61	.434	0.73	0.33	1.62
Less than HS education	-.36(.39)	0.88	.348	0.70	0.33	1.48
Unemployed	.43(.42)	1.03	.310	1.54	0.67	3.54
Never Married	-.38(.39)	0.93	.334	0.69	0.32	1.47
Repeated Injections	.75(.34)	4.71	.028	2.12	1.08	4.16