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The Mediating Role of Impulsive Choice between Childhood  
Maltreatment and Criminal Thinking

by

Kathleen R. Smith

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the Department of Psychology

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## Committee Approval

To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of KATHLEEN R. SMITH find it satisfactory and recommend that it be accepted.

---

Steven R. Lawyer, Ph.D.,  
Major Advisor

---

Shannon M. Lynch, Ph.D.,  
Committee Member

---

Linda Hatzenbuehler, Ph.D. ABPP,  
Committee Member

---

Erin B. Rasmussen, Ph.D.,  
Committee Member

---

Deirdre Caputo-Levine, Ph.D.,  
Graduate Faculty Representative

## Human Subjects Committee Approval

May 8, 2018

Kathleen Smith  
Psychology  
MS 8112

RE: regarding study number IRB-FY2018-254: Predictors of Criminal Thinking

Dear Ms. Smith:

Thank you for your responses to a previous full-board review of the study listed above. These responses are eligible for expedited review under OHRP (HHS) and FDA guidelines. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before May 8, 2019, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; email humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP  
Human Subjects Chair

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# The Mediating Role of Impulsive Choice between Childhood Maltreatment and Criminal Thinking

Dissertation Abstract—Idaho State University (2019)

Incarcerated individuals experience childhood maltreatment (i.e., verbal abuse, physical abuse, sexual abuse, and neglect) at disproportionate rates compared to individuals who have never been in jail or prison. Childhood maltreatment increases the risk for criminal thinking, an established risk factor for criminal behavior. Additionally, repeated exposure to traumatic events in childhood negatively impacts self-regulatory behaviors, such as insensitivity to delayed rewards and risk-taking behaviors. Taken together, impulse control and risk-taking are possible mechanisms that underlie the relationship between childhood maltreatment and criminal thinking. This study aims to examine the role of impulsivity as an underlying mechanism between childhood maltreatment and criminal thinking patterns in incarcerated men. Participants were 125 adult male inmates recruited from two local jails in Southeastern Idaho. It was hypothesized that increased severity of childhood maltreatment and impulsive choice would predict higher levels of criminal thinking patterns. A sequential multiple regression analysis controlling for age, education level, and substance use was used to examine how childhood maltreatment, and impulsive choice predict criminal thinking patterns (i.e., general, reactive, and proactive) in incarcerated adult men. More specifically, this study examined whether impulsive and risk-taking related decision making for monetary outcomes, as measured through delay and probability discounting paradigms mediated the relationship between childhood maltreatment and criminal thinking in adult male inmates. Analyses indicated probability discounting differentially predicted criminal thinking styles. Decision-making for monetary outcomes did not mediate the relationship between childhood maltreatment and criminal thinking. Identification of mechanisms leading to criminal thinking is important in order to effectively design and implement intervention and prevention strategies for reducing recidivism and incarceration.

Key Words: Childhood Maltreatment; Criminal Thinking; Delay Discounting; Probability Discounting; Impulsivity; Risk-taking

## The Mediating Role of Impulsive Choice between Childhood Maltreatment and Criminal Thinking

In 2014, over 2.2 million adults were incarcerated in the US federal and state prisons, and county jails, according to the US Bureau of Justice statistics. An additional 4.7 million adults were on probation or parole (US Bureau of Justice Statistics, 2017). These individuals range in ethnicity, age, and type of crime, but a common factor among many incarcerated individuals is significant dysfunction in their pre-incarceration lives. Incarcerated individuals experience childhood maltreatment and adverse experiences, such as abuse, neglect, parental incarceration, or parental substance use at increased rates compared to individuals who have never been incarcerated (Levenson, 2014; Levenson & Grady, 2016; Reavis et al., 2013). These early life experiences are associated with severe long-term consequences such as incarceration, physical health problems, and psychopathology.

Childhood abuse and maltreatment is recognized as a public health concern in the U.S. (Bucci et al., 2016; Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007; Larkin, Felitti, & Anda, 2014). These early life experiences are associated with several public health concerns including increased obesity, sleep disturbances, aggression, intimate partner violence, memory deficits, substance use and criminal behavior (Anda et al., 2006; Campbell, Walker, & Egede, 2016; Dargis, Newman, & Koenigs, 2016; Dube et al., 2006; Felitti et al., 1998; Fox, Perez, Cass, Baglivo, & Epps, 2015; Matsuura, Hashimoto, & Toichi, 2013; Wilcox, Richards, & O’Keeffe, 2004). In addition, these public health outcomes are associated with impulsive behaviors and a lack of regard for consequences for the well-being of themselves or others. Therefore, Palmer and Humphries (2016) argue researchers should examine the mechanisms underlying these negative behaviors and criminal thinking styles that may result in offenders having more

difficulty completing treatment programs or committing crimes post release due to increased levels of impulsivity without intervention.

### **Childhood Maltreatment and Adverse Childhood Experiences**

The prevalence of childhood maltreatment cannot be overstated; according to the Centers for Disease Control and Prevention (CDC, 2016) there were 702,000 victims of child abuse and neglect reported to child protective services in 2014. Childhood maltreatment includes psychological, physical, emotional, and sexual forms of abuse and neglect, whereas adverse childhood experiences (ACEs) includes these forms of abuse as well as household dysfunction (e.g., domestic violence, substance abuse, divorce, or an incarcerated family member) (CDC, 2016) and all can have long-term consequences for adults. ACEs are linked to several negative health and behavioral outcomes, including health problems, psychological problems, problematic substance use, and incarceration (Campbell, Walker, & Egede, 2016; Dargis, Newman, & Koenigs, 2016; Dube et al., 2006; Felitti et al., 1998; Fox, Perez, Cass, Baglivo, & Epps, 2015; Matsuura, Hashimoto, & Toichi, 2013; Wilcox, Richards, & O’Keeffe, 2004).

In one of the first studies to examine long-term health outcomes in relation to multiple types of abuse, Felitti and colleagues (1998) conducted a large-scale study within a primary care setting by surveying 13,494 adults on seven adverse childhood experiences and compared these to negative adult health outcomes. The study retrospectively examined the long-term impact of childhood abuse and dysfunction on adult outcomes such as disease risk factors, quality of life, mortality, and incidents of behavioral health outcomes in adulthood including smoking, obesity, depression, alcoholism, drug use, number of sexual partners, and sexually transmitted disease. Of the 9,508 individuals who completed the study, more than half (52%) reported at least one ACE, and 6.2% reported more than four adverse childhood exposures. The researchers found that individuals who had experienced four or more categories of adverse childhood experiences

compared to those who had experienced zero had significantly increased health risks for alcoholism, drug abuse, depression, and suicide attempts. The authors concluded there is a strong, cumulative effect of ACEs on adult health. Tuscic, Flander, and Mateskovic (2013) reported up to 43% of children experience cumulative forms of abuse that result in long-term consequences.

More recently, Campbell and colleagues (2016) examined the association among ACEs, high-risk health behaviors, and comorbidity among 48,526 U.S. adults. Consistent with Felitti and colleagues (1998), 55.3% of respondents reported at least one out of 11 ACE categories and 13.7% reported four or more ACEs (Campbell et al., 2016). A score of four or more in this sample was associated with increased odds for binge drinking, heavy drinking, risky HIV behavior, smoking, depression, and other negative physical health outcomes. Increased ACE scores were associated with being younger, being female, being a minority, having a lower education, and having lower income. The authors found a dose-response effect in that risky behavior increased as a function of increased ACE scores. Notably, sexual abuse and verbal abuse were the two ACE components that independently affected most of the outcomes (Campbell et al., 2016). However, both authors indicated there is a need for better understanding of mediators affecting the relationship between childhood maltreatment and adult health outcomes (Campbell et al., 2016; Felitti et al., 1998).

Childhood maltreatment is related to numerous negative adult health outcomes. For example, individuals with a history of childhood abuse or neglect show a large number of problems including depression, anxiety, PTSD, somatic complaints, personality disorders, homelessness, and incarceration (Reavis et al., 2013; Roos et al., 2016; Tuscic, Flander, & Mateskovic, 2013). Individuals with the most severe ACEs profile (i.e., high risk of caregiver substance use, physical abuse, physical neglect, emotional abuse, and interpersonal violence



exposure) experience the highest risk of incarceration (Roos et al., 2016). Windom and Maxfield (2001) estimate childhood maltreatment increases risk for later criminality by 59% in juveniles and increases the likelihood of adult criminal behavior by 28%.

Indeed, individuals who have experienced childhood maltreatment overrepresented among incarcerated samples (Levenson & Grady, 2016; Reavis et al., 2013; Roos et al., 2016; Rossegger et al., 2009). Male child abusers, domestic violence offenders, sex offenders, and stalkers ( $n = 151$ ) have significantly higher rates of ACEs than men in the general population (Reavis et al., 2013). In contrast, incarcerated women endorse a greater number of adverse childhood experiences than men (Levenson, 2014; Levenson, Willis, & Prescott, 2015). Further, individuals in institutionalized settings are at an increased likelihood of having experienced verbal abuse, physical abuse, parental divorce, and sexual abuse before the age of 18. In a large study that included community correction participants ( $N=19,422$ ), 6.7% (1,298 individuals) of the sample reported a history of sexual abuse (Clark et al., 2012). These adverse early childhood experiences may have detrimental effects on individuals that predispose them to vulnerabilities later in life such as psychological problems, violence, impulsive choice behaviors, or criminal behavior.

Other experiences accounted for within the examination of childhood maltreatment includes witnessing violence or experiencing parental incarceration. Kennedy and colleagues (2002) examined the consequences of witnessing interparental aggression within 73 heterosexual couples. They found the father's aggression predicted increased anger as adults when there was reported conflict in adulthood for both male and females. Similarly, 6.5% of adults are exposed to parental incarceration during childhood which impacts children's psychological health by increasing symptoms of depression and anxiety as well as increased aggressive behaviors (Gjelsvik, et al., 2014). Children who experience parental incarceration are likely to be non-

White, less educated, have poorer mental health, have an increased likelihood of poor physical health in adulthood, and are more likely to have experienced additional ACEs, compared to individuals who did not experience a parental incarceration (Gjelsvik, et al., 2014).

Individuals who experience trauma, abuse, or neglect in childhood are at a greater risk of committing violence as juveniles as well as in adulthood (Baglivio, Wolff, Piquero, & Epps, 2015; Clark et al., 2012; Fox et al., 2015; Levenson, 2014; Tuscic, Flander, & Mateskovic, 2013). A history of childhood abuse is related to an increased vulnerability to stress as well as difficulties with interpersonal relationships, communication skills, coping skills, and stress. Additionally, abuse and neglect increase the risk of domestic violence in adulthood, early sexual activity, substance abuse, psychopathy personality features, antisocial personality disorder, and problems in thinking and social withdrawal (Dargis et al., 2016; Tuscic et al., 2013). Physical abuse is associated with several negative behavioral outcomes and externalizing disorders (Dargis et al., 2016; Tuscic, Flander, & Mateskovic, 2013) including violent and aggressive behavior or oppositional defiant disorder. Thus, children with a history of abuse show difficulties in emotion regulation, cognitive deficits, mental health problems, adopt risky lifestyles, show higher levels of aggression, delinquency, antisocial behavior, and criminal behavior (Tuscic et al., 2013). Levenson (2014) found higher ACE scores in incarcerated male sexual offenders were significantly correlated with young victims, contact victims, more nonsexual arrests, and violence and aggression. Her results suggest antisocial behaviors are associated with early adverse experiences. Additionally, her findings demonstrate a connection between ACE scores and risk factors for recidivism (Levenson, 2014).

### **Childhood Maltreatment Severity**

If a child experiences a large number of various types of abuse, there may be greater problems in psychological adjustment (Dargis et al., 2016; Tuscic, Flander, & Mateskovic,

2013). Windom (2017) completed a review of the literature and reported numerous studies have evidenced a relationship between childhood maltreatment and subsequent crime and violence. Of all childhood maltreatment, neglect remains a significant predictor of delinquency and criminal behavior, above and beyond factors relating to neglect such as social economic status.

More specifically, Ogloff and colleagues (2012) conducted a 45-year follow-up on 2,759 individuals who experienced childhood sexual abuse between 1964-1995 to examine subsequent criminal offending. The researchers found childhood sexual abuse victims were 1.4 times more likely to have some form of contact with the police compared to the general community and 5 times more likely to be charged with a criminal offense. Dargis and colleagues (2016) examined 183 incarcerated adult male offenders and found the severity of overall childhood maltreatment predicts the severity of psychopathy and antisocial personality disorder in adulthood.

Psychopathy was a construct developed to describe individuals associated with a socially deviant lifestyle defined by pattern of interpersonal (e.g., grandiose, arrogant, callous, and manipulative) affective (e.g., short-tempered, unable to form strong emotional bonds with others, and lack remorse), and lifestyle characteristics (e.g., impulsive, violate social norms) with a history of victimizing others in violent and aggressive ways (Hare, 1999). Many individuals within the criminal justice system may meet criteria for a diagnosis of antisocial personality disorder, and psychopathy was developed to describe those who are more aggressive and violent. Psychopathy is significantly related to greater overall abuse histories and was specifically related to physical, emotional, and sexual abuse and neglect (i.e., physical and emotional). The relationship between severity and psychopathy was particularly strong for physical abuse, and sexual abuse was uniquely related to juvenile conduct disorder severity, rather than adult psychopathy or antisocial behaviors (Dargis et al., 2016).

Researchers agree the degree, or severity, of abuse that a child has experienced should be considered over the type of abuse to which he/she is exposed (Baglivio et al., 2015; Higgins & McCabe, 2000). Therefore, the literature suggests research on childhood maltreatment examine the number of maltreatment occurrences as well as the severity of the experiences. Historically, researchers studying childhood abuse tend to focus on one type of abuse (i.e., physical abuse or sexual abuse), but current research on abuse histories highlight the importance of studying the accumulation of multiple types of abuse experiences. Experiencing one adverse event significantly increases the odds of experiencing additional adverse events in a dose-response relationship (Baglivio, et al., 2015; Levenson, 2014; Levenson & Grady, 2016; Levenson, Willis, & Prescott, 2015). Approximately 13.5-43% of children experience more than one form of abuse (Tuscic, Flander, & Mateskovic, 2013) and cumulative ACEs, or forms of maltreatment, are linked to increased problematic health behaviors as well as increased violence. Anda and colleagues (2006) found that individuals with four or more ACEs were at an increased risk for psychiatric problems (e.g., anxiety, depression, and hallucinations), physical health concerns (e.g., obesity, sleep difficulties, and somatic complaints), substance abuse and risky behaviors (early intercourse and promiscuity), and cognitive and emotional difficulties (e.g., memory problems, anger, and aggression).

There also is a strong connection between childhood maltreatment and juvenile offending patterns. The vast majority (75-93%) of youth entering the juvenile system have experienced some type of trauma (Baglivio et al., 2015). Matsuura, Hashimoto, and Toichi (2013) examined relationships among ACEs, aggression, depression, and self-esteem in serious female juvenile offenders in Japan through an SEM model. The model suggested 20% of juveniles experienced multiple adverse experiences (i.e.,  $\geq 4$  ACEs) compared to 7% of high school students in a comparison group. The model also suggests self-esteem is negatively impacted by cumulative

ACEs, increased levels of aggression, and significantly elevated depressive symptoms (Matsuura, Hashimoto, & Toichi, 2013). Recent studies indicate that with each cumulative adverse experience a child has, there is an increased risk for becoming a serious, violent, and chronic (SVC) juvenile offender (Baglivio et al., 2015; Fox et al., 2015). Fox and colleagues (2015) examined adverse experiences and criminal behavior in 22,575 juvenile offenders. Compared to the adults in the original ACE study (Felitti et al., 1998), Fox and colleagues (2015) found juvenile offenders were 4 times as likely to have experienced four or more ACEs (Fox et al., 2015). Above and beyond the impact of other criminal behavior risk factors (i.e., gender, race/ethnicity, age of criminal onset, measures of subjective impulsivity, anti-social peer influence, SES) the ACE score was a strong predictor of SVC offending. The two strongest ACE predictors in the juvenile sample included having an incarcerated household member and experiencing physical abuse (Fox et al., 2015).

### **Role of the Prefrontal Cortex**

Adverse events in infancy and early childhood are associated with functional and structural changes in the brain (Creeden, 2009; Fox et al., 2015; Roos et al., 2016; Cross, Fani, Powers, & Bradley, 2017; Levenson & Grady, 2016; Tuscic, Flander, & Mateskovic, 2013) that can influence the development of the prefrontal cortex, which impacts executive functioning (EF). EF is an aspect of self-regulation utilizing attention shifting, working memory, and inhibitory control cognitive processes that help with planning, problem solving, and goal directed behavior (Roos et al., 2016). Chronic stress (e.g., maltreatment) produces prolonged chemical responses that affect both biological and psychological development causing neural impairment that disrupts processes central to well-being and normal development (Fox et al., 2015). Overall, long-term abuse leads to over-activation of certain brain areas, including the physiological stress response system. Long-term activation of the stress response system may interact with genetic

and epigenetic processes during critical periods of development and result in a host of problems (i.e., sleep difficulties, hyperactivity, or emotional development) (Cross et al., 2017; Tuscic et al., 2013).

Repeated exposure to traumatic experiences are associated with changes in the prefrontal cortex, hippocampus, and amygdala during development that may impact self-regulatory behaviors and emotional responses (Teicher, Anderson, Polcari, Anderson, & Navalta, 2002). Neurological deficits within the PFC may present as irritability, impulsive behavior, delays in reaching developmental milestones, slow learning, a lack of empathy, difficulty recognizing consequences, or difficulty expressing or identifying emotions in oneself or others (Creeden, 2009; Baglivio, Wolff, Piquero, & Epps, 2015; Levenson & Grady, 2016; Roos et al., 2016). These effects on neurological development are pronounced in regions of the brain associated with understanding emotions, impulse control, and impulsive behavior. The ability to regulate emotions is an important aspect of development as it allows for effective peer interactions, effective cognitive performance in tasks involving delaying inhibition or pursuing long-term goals, and the management of stress (Creeden, 2009; Dargis et al., 2016). Dysfunction with emotion regulation has been associated with greater disinhibition, aggression and violence towards self and others, and criminality (Dargis et al., 2016; Newman, Kosson, & Patterson, 1992; Teicher et al., 2002). Therefore, maltreatment and adverse childhood experiences may increase one's vulnerability to engage in risk-taking behaviors, maladaptive coping strategies (i.e., substance use), or delinquent activities that may result in incarceration or criminal thinking (Dargis et al., 2016; Roos et al., 2016).

Adolescence is a developmental period associated with increased risk taking and acting without thinking that may be due, in part, to changes within the PFC that lead to deficits in the PFC (Romer et al., 2011). Although not all risk-taking behavior is associated with EF deficits,

externalizing behavior problems (e.g. personality disorders and psychopathy) (Dargis et al., 2016; Romer et al., 2011) are shown in individuals with deficits in EF. Externalizing behavior problems in adolescents can increase in severity to result in a diagnosis of Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD). Notably, 33% of adolescents diagnosed with CD meet criteria for antisocial personality disorder in adulthood, which is associated with many criminal traits, including psychopathy.

Researchers interested in psychopathy have investigated the role of the dorsolateral prefrontal cortex (dlPFC) due to the connection with aggressive impulses, and the regulation of emotion and behaviors. Hoppenbrowers and colleagues (2012) examined 13 male psychopathic offenders and found inhibition deficits within the dlPFC, indicating an inability to regulate impulses compared to non-psychopathic individuals. Thus, deficits within these essential cognitive processes appears to be a vulnerability for an individual to make impulsive, disinhibited, choices which may result in legal and personal consequences. Further, sexual abuse history is uniquely related to juvenile conduct disorder severity, rather than adult psychopathy or antisocial behaviors. Thus, Dargis, et al. (2016) suggest abuse or neglect early in life may result in cognitive deficits that contribute to criminal offending behavior.

Becerra-Garcia (2014) examined the influence of childhood abuse history on adulthood EF in male offenders and found that in comparison with controls (n=17) and with non-abused offenders (n=22), the abused offenders (n=18) have poorer performance on psychomotor-cognitive processing speed and cognitive flexibility as assessed by Trail Making Tasks. Furthermore, physical abuse events have the most significant impact on EF (Becerra-Garcia, 2014). In a study with aggressive participants, there was a relationship between EF, verbal learning memory, and impulsivity where lower levels of working memory (WM) were correlated with higher levels of impulsivity (Kockler & Standford, 2008). In other words, individuals with

low cognitive abilities, specifically low WM abilities, have difficulty planning for the future and have reduced concern about later consequences on both self-report and behavioral measures of impulsivity (Arantes et al., 2013; Kockler & Standford, 2008; Snoyman & Aicken, 2011). These results indicate offenders with low cognitive ability have a combination of acting without thinking and a lack of concern for consequences which differentiates them from many other offenders (Snoyman & Aicken, 2011).

### **Criminogenic Thinking**

Criminal thinking is one of the most well-established risk factors for criminal behavior (Andrews, Bonta, & Hoge, 1990; Boduszek et al., 2013; Cuadra, Jaffe, Thomas, & DiLillo, 2014; Gendreau, Little, & Goggin, 1996; Mandracchia, Morgan, Garos, & Garland, 2007; Mandracchia et al., 2015). Criminal thinking is defined as a distorted pattern of thought content (based on conventional rules of society), such as attitudes, values, and justifications, that initiates and maintains law breaking behavior and a criminal lifestyle (Walters, 2006, Taxman, Rhodes, & Dumenci, 2011; Sana & Batool, 2017). Individuals with more criminal thinking errors, (e.g., “Even when I got caught for a crime I would convince myself that there was no way they would convict me or send me to prison”), tend to continue making decisions that result in criminal behavior (Walters, 2006). More recently, criminal thinking has been conceptualized as a criminogenic need, or characteristic of an individual that relates to the likelihood of reoffending. Procriminal attitudes (i.e., criminal thoughts, values, and sentiments supportive of criminal behavior) are believed to promote and support criminal activities (Andrews & Bonta, 2010; Sana & Batool, 2017). Thus, the term criminogenic thinking has emerged to differentiate patterns of thought which are not illegal, yet perpetuate maladaptive and criminal behavior through patterns of cognitions that perpetuate criminal behavior that is predictive of illegal or problematic behaviors (Whited, Wagar, Mandracchia, & Morgan, 2017).



### **The Lifestyle Model of Criminal Conduct**

The Lifestyle Criminal Model has informed research on the underlying environments, choices, and thought processes associated with criminal behavior. Walters (1990) describes the Lifestyle Model of Criminal Conduct as an interaction between three vulnerabilities (i.e., conditions, choices, and cognitions) that perpetuates a criminal lifestyle through criminogenic thinking, or cognitive patterns that justify, support, and rationalize antisocial activities. Identifying criminogenic thinking is important because different thought patterns criminal endorse can help better classify, predict, and provide interventions for the criminal behavior based on the patterns endorsed (Walters, 2014).

The Criminal Lifestyle Model was heavily influenced by classical and positivist movements in sociology including Sykes and Matza's (1957) theory of deviance and Yochelson and Samenow's (1976) research on the criminal personality and 52 potential thinking patterns. Within these theoretical backgrounds, crime was argued to either be due to personal choice or various environmental factors where individuals would justify their actions. Taking these theories into consideration, the Lifestyle Model of Criminal Conduct was further refined by Walters and hypothesizes criminal behavior results from environmental conditions (i.e., developmental experiences) and personal choice (i.e., decision-making), but also added the role of cognitions (i.e., criminogenic beliefs) as an explanatory factor for criminal behavior. In this model, cognitions are defined as cognitive processes or beliefs that are instrumental to the initiation and maintenance of maladaptive, criminal behaviors (Walters, 1990). Within this theory, these three vulnerabilities emerge into an interacting system associated with criminal behavior. From this perspective, individuals with a habitual criminal lifestyle are thought to be oriented towards immediate gratification, pleasure-seeking behaviors, and egocentrism in which

their own needs take precedence over others and is developed based on their life experiences, the choices made, and their belief orientations.

### **Conditions**

Individuals are born with certain biological characteristics and into specific environments that affect their developmental trajectories. One of the vulnerabilities for a criminal lifestyle includes physical, social, and psychological developmental conditions that may be internal or external and are considered either personal variables (e.g., genetics, temperament, emotions, and intelligence) or environmental variables (e.g., family relationships, substances, and social economic status) that influence a person's actions. These personal and environmental variables that influence an individual are considered conditions (Walters, 1990). Walters (1990) theorizes conditions do not cause criminal behavior, but influences one's choices by limiting options immediately available. However, choices are made from currently available options and typically depend on one's environment. Actions or decisions that are punished are discontinued while actions or decisions that are reinforced are continued. For example, an individual raised with parents who abuse substances and are emotionally unavailable may respond differently in how they develop attachment to their parental figures, which may lead to inadequate functioning with others, leading to reinforced maladaptive behaviors. Further, the individual and the situation interacts throughout life where an individual may rationalize actions, engage in reinforcing behaviors, and have a positive self-image despite lawbreaking behavior. Throughout life, an individual develops a pattern of cognitions based on early conditions that justify and rationalize actions and decisions.

The environments, or conditions, suggested to impact criminal life have been supported by research as individuals within the criminal justice system experience childhood maltreatment at a disproportionate rate compared to the general public (Levenson & Grady, 2016).

Developmental conditions that impact one's choices or beliefs may be either internal or external factors. External conditions are cited in the literature as being related to maladaptive and criminal behavior in chaotic home environments where children endure abuse or neglect, overcontrolled parenting environments, and negative peer associations (Baglivio, et al., 2015; Gonzalez et al., 2014; Roos et al., 2016; Whited et al., 2017).

Abusive family relationships tend to have cyclical patterns for aggressive family dynamics which perpetuates a cycle of violence that predicts poor coping skills and negative views of self and others (Dargis et al., 2016; Garrett, 2010; Gonzalez, Mandracchia, Nicholson, & Dahlen, 2014). Incarcerated men who have experienced and perpetrated childhood abuse easily recall more negative childhood events, develop more negative self-concepts and pathological personality traits (i.e., psychoticism, impulsivity), and have negative social relationships that influence choices to engage in risky or criminal behaviors (Boduszek et al., 2013; Garrett, 2010; Mishra & Lalumiere, 2011; Zeigler-Hill, Mandracchia, Dahlen, Shango, & Vrabel, 2017). Beyond children being in environments where parents are abusive or neglectful, maladaptive behaviors increase as parenting becomes more restrictive and controlling as well (Gonzalez et al., 2014).

### **Choices**

The second vulnerability determining criminal lifestyle is choices. Walters (1990) postulates that individual choices one makes may be influenced by certain personal or situational conditions (e.g., the 'conditions' above). In this model, conditions impact one's behavior but they do not determine choices. Rather, individual interpretations of a condition determine how one behaves. Thus, individuals make infinite criminal and noncriminal choices within the confines of their environment and choose how to engage in particular actions (Walters 1990; Walters 2015b). Within this model, individuals have the capability to think, rationalize, and

make informed decisions about a range of choices, that may be either criminal or non-criminal through a cost-benefit analysis, possibly based on emotional information (Walters, 2015b). The subsequent choices made by an individual may determine criminal behavior through developing a system of thought that serves to support choice via an interaction in the form of the third vulnerability, cognition (Walters 1990).

With regard to negative social relationships, criminal behavior is often related to affiliation with criminal peer associates. However, recent research indicates the amount of time one chooses to spend with criminal associates is predictive of criminal thinking beyond the number of associates one has (Whited, Wagar, Mandracchia, & Morgan, 2017). Thus, these early conditions, specifically aversive experiences, affect individual's attitudes, decision-making, and thought patterns later in life but appear to interact with choices and beliefs (Levenson & Grady, 2016; Walters, 1990).

### **Cognitions**

Cognition, the third vulnerability of the criminal lifestyle model, identifies how thinking styles develop in response to the conditions one is exposed to, as well as the choices made based on the conditions. Early life experiences appear to contribute to the negative thinking patterns that adult offenders utilize in criminal behaviors. Arantes and colleagues (2013), theorize that criminal behavior occurs due to decreased self-control and impaired ability to make effective long-term decisions. Cuadra, Jaffe, Thomas, and DiLillo (2014) identified criminal thinking styles as a mechanism in the association between childhood maltreatment and adult criminal offending. The researchers examined 338 adjudicated adult male offenders from a state correctional facility and found a significant relationship between child maltreatment experiences and overall adult criminal behavior. This relationship was fully mediated by general criminal thinking styles proposed by Walters (1990). Thus, as the Criminal Lifestyle model suggests, a

history of maltreatment or early life conditions may contribute to criminal behaviors in adulthood through cognitive beliefs that justify, support, and rationalize criminal thinking and subsequent behaviors (Cuadra et al., 2014).

Undergraduate students are not typically labeled as psychopaths or engage in criminal lifestyles, but their underlying attitudes, traits, and thinking can provide a window into these basic human processes. Riopka and colleagues (2015) found that as supportive thinking about law violations increased the number of antisocial behaviors increased, even with low levels of criminal thinking. Within this student sample, individuals with higher self-reported psychopathic traits were more likely to endorse higher levels of criminal thinking. Indeed, individuals who have personality features such as antisocial behavior or meet criteria for psychopathy are more likely to have strong general criminogenic thinking, even after controlling for demographic variables such as age, race/ethnicity, education, index offense, sentence length, time served (Boduszek et al., 2013; Egan, McMurrin, Richardson, & Blair, 2000; Mandracchia et al., 2015; Riopka et al., 2015). Behaviors including instability, impulsivity, and irresponsibility—which characterize secondary psychopathy—are closely associated with criminal thinking and recidivism compared to primary (e.g., callousness, deceitfulness, and grandiosity) psychopathy behaviors (Mandracchia et al., 2015).

In sum, the Criminal Lifestyle Model adds to the Rational Choice Theory (Cornish & Clark, 1986) and General Theory of Crime (Gottfredson & Hirschi's, 1990) by taking into account how developmental conditions affect one's choices, which in turn affect how one interacts with the environment and, in turn, one's belief system. Current research continues to support this model suggesting internal (e.g., genetics, neurophysiology, temperament, emotions) and external factors (e.g., family dynamics, social economic status, peers) influencing our early exposure in life does impact our thinking and decision making in later life (Gonzalez et al., 2014;

Leverso, Bielby, & Hoelter, 2015; Mandracchia et al., 2015; Whited et al., 2017). Further, even low levels of antisocial thoughts or behaviors may be influenced by the conditions and reinforced choices an individual has made. Thus, the conditions, choices, and cognitions perpetually interact to influence potential maladaptive behaviors and personality characteristics (e.g., impulsivity) that influence criminogenic thinking and decision making.

### **Eight Patterns of Thinking**

The criminal lifestyle theory identifies eight primary cognitive styles that reflect criminogenic thinking. These eight patterns of thinking are irritational beliefs held by individuals that lead to irresponsibility, self-indulgence, interpersonal intrusiveness, and social rule breaking behaviors in habitual criminals. Each of the beliefs are also observed in non-criminals; however, the difference for lifestyle criminals appears to be in the degree to which the beliefs are held. The eight primary cognitive patterns identified include: Mollification, Cutoff, Entitlement, Power Orientation, Sentimentality, Superoptimism, Cognitive Indolence, and Discontinuity.

According to Walters (1990) a lifestyle criminal is hypothesized to have the belief pattern of *Mollification*, which focuses on external factors (i.e., circumstances, events, or conditions) that minimize the seriousness of one's actions. This belief system lends itself towards an individual blaming the victim or having beliefs of being treated unfairly, both utilized to justify their behavior or to divert responsibility. The *Cutoff* belief system is a voluntary response, either external (i.e., substance use) or internal, such as a word or phrase (i.e., "fuck it"), which allows the habitual criminal to rapidly eliminate the deterrents that diminishes fear or anxiety that would otherwise keep an offender from committing a crime. The *Entitlement* belief orientation asserts having a sense of ownership or uniqueness that promotes the individual belief that society's rules do not apply to them. An individual with this belief system may use manipulation, intimidation, or physical violence to exercise their attitudes of entitlement and privilege. Similarly, *Power*

*Orientation* is when an individual is obsessed with gaining a sense of power and control over the environment, typically power over other people. The *Sentimentality* belief system specifies a habitual criminal will engage in behaviors to convince self and others of being a “good person” although the individual does not experience the full destructiveness of their criminal lifestyle as they continue to violate rules and the rights of others. The *Superoptimism* orientation is an unrealistic appraisal of one’s ability to elude authorities through learning one can get away with most criminal activity. Then, the criminal overestimates their ability to engage in more enticing law-breaking behavior than the previous behavior. The Superoptimistic individual functions on desires and does not think about rational alternatives, particularly when chances of being detected are uncertain. The *Cognitive Indolence* belief includes being lazy in thought and action, or even self-defeating by taking short-cuts, or irresponsible behavior (e.g., quitting job without notice) that may move them away from meaningful goals. Finally, the *Discontinuity* belief orientation makes problem-solving and goal attainment difficult as the individual fails to follow through on commitments overtime, which can make living in unstructured settings (i.e., the community) difficult for offenders (Walters, 1990).

The eight thinking patterns established by Walters (1990) have been simplified in more recent research (Mandracchia et al., 2007) to include three primary criminogenic thinking characteristics. The simplification was based on identifying 77 thinking patterns, including 38 from Yochelson and Samenow’s (1976) theory, 8 thinking patterns from Walters’ (1990) theory, 12 from Beck and 20 from Ellis. A factor analysis was completed demonstrating three factors including control (i.e., desire for power), cognitive immaturity (i.e., poor social problem solving), and entitlement (i.e., thinking focused on self) (Mandracchia et al., 2007) are supported through antisocial attitudes and values, impulsivity, and pro-criminal associates (Mandracchia et al., 2015; Palmer & Humphries, 2016). Although the three-factor model reflects a simple

conceptualization, each of the eight criminal thinking styles described by Walters is captured within the three identified factors. Overall, these three factors support that even noncriminal maladaptive thinking patterns contribute to cognitive processes that influence criminal behavior.

Based on the eight primary thinking styles, Walters (1995) developed the Psychological Inventory of Criminal Thinking Styles (PICTS) to assess thinking patterns associated with criminal behavior, regardless of the offense type, as to measure how an offender thinks. The PICTS has been utilized in various samples (Cuadra, Jaffe, Thomas, & DiLillo, 2014; Morgan, et al., 2010; Palmer & Humphries, 2016; Walters, 2002; Walters, 1995; Walters, 2013; Walters, 2015a; Walters & Lowenkamp, 2016; Varghese et al., 2014) including non-offender samples (Gonzalez, Mandracchia, Nicholson, & Dahlen, 2014) to identify criminal thinking. The PICTS is organized in a hierarchical structure that includes an overall scale of General Criminal Thinking, which is the sum of the eight primary thinking styles Mollification (Mo), Cutoff (Co), Entitlement (En), Power Orientation (Po), Sentimentality (Sn), Superoptimism (So), Cognitive Indolence (Ci), and Discontinuity (Ds). There are also two subscales including proactive and reactive criminal thinking scales. Proactive criminal thinking describes criminal thinking patterns that are calculated and planned whereas reactive criminal thinking measures spontaneity, opportunity, rashness, and impulsivity in criminal thinking patterns. Reactive aggression and criminal thinking correlate with anger, impulsive choice on behavioral tasks, and predicts interpersonal violence (Varghese et al., 2014; Walters, 2007).

### **Impulsivity**

Impulsivity is a multidimensional construct (Barnhart & Buelow, 2017; Meda et al., 2009) that is easy to discuss, but difficult to define. In general terms, impulsivity can be characterized by a variety of behaviors ranging from normal to maladaptive behaviors such as a lack of fore-thought or self-control that may lead to poor outcomes, acting without thinking, the



inability to wait, or insensitivity to delayed consequences (Ainslie, 1975; Baltieri & Andrade, 2008; de Wit, 2008; Evenden, 1999). Impulsivity can be measured in a variety of ways, including interviews, self-report measures, and behavioral tasks.

### **Self-report Measures of Impulsivity**

Frequently used self-report measures of impulsivity include the Barratt Impulsivity Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995), the I7 Questionnaire (Eysenck, 1985), the UPPS-P (Whiteside & Lynam 2001), and the BIS/BAS (Carver & White, 1994). The BIS-11 is a self-report inventory of behaviors frequently used to measure impulsivity in offender populations by measuring three types of impulsive activities (i.e., motor impulsiveness, non-planning impulsiveness, and attentional impulsiveness), in which two scales, attentional and non-planning impulsiveness, are associated with aspects of memory functioning.

Offenders with low cognitive abilities (i.e., IQ below 75) or lower working memory (WM) abilities are more likely to report feeling and acting in ways that indicate higher impulsivity (Kockler & Stanford, 2008; Snoyman & Aicken, 2011). WM and cognitive performance are consistently impaired in psychopathic offenders (Hoppenbrowers et al., 2012) and offenders score significantly higher on the BIS-11 (Arantes et al., 2013) than do non-offenders. Violent offenders report the most impulsivity (Snoyman & Aicken, 2011). Similarly, sexual offenders with three or more victims scored significantly higher on the BIS-11 compared to sexual offenders with one victim (Baltieri & Andrade, 2008). These offenders also had an increased likelihood of experiencing early adverse experiences. When examining completion of an offender treatment program, those who did not complete treatment had significantly higher impulsivity on the non-planning portion of the BIS-11, indicating less concern for long-term goals (Palmer & Humphries, 2016). Therefore, self-report measures such as the BIS-11 provide

valuable information about impulsive behaviors, but are limited due to the subjective account provided by the individual.

Current research on prison and community participants found increased traits of psychopathy (i.e., boldness and disinhibition) are associated with sensation seeking and difficulty thinking about consequences of actions, respectively (Weidacker, O'Farrell, Gray, Johnston, Snowden, 2017). Therefore, these results indicated individuals with increased traits of psychopathy have the ability to take planned risks in a non-impulsive and unemotional manner, suggesting the importance of using behavioral tasks that measure both risk-taking and delayed outcomes.

### **Behavioral Measures of Impulsivity**

Behavioral choice measures are another form of measuring impulsivity that are objective models of human and animal choice. Behavioral tasks are important tools to use for measuring impulsivity because they capture the process of an individual's current decision making, represent a behavioral component of impulsivity not captured in self-report measures, and allows for identification, prediction, and intervention of impulsive choice (Baker, Johnson, & Bickel, 2003; Coffey, Gudleski, Saladin, & Brady, 2003).

### **Delay and Probability Discounting**

Delay and probability discounting are behavioral measures of impulsive choice that examine an individual's sensitivity to delayed and uncertain outcomes, respectively. As such, impulsivity measured by delay discounting is associated with insensitivity to delayed consequences or an inability to wait for a delayed reward and is a behavioral indicator of self-control and the construct impulsivity (Baker et al., 2003). In contrast, measuring impulsivity with a probability discounting task is associated with risk-taking behaviors or sensation-seeking.

Delay discounting and probability discounting evidence separate underlying processes of impulsivity, suggesting that impulsive individuals may not be risk-takers, and that impulsive individuals do not automatically discount probabilistic outcomes (Baumann & Odum, 2012; De Wit, 2008; Holt, Green, & Myerson, 2003; Green, & Myerson, 2004; Loughran, Paternoster, & Weiss, 2012; Madden, Petry, & Johnson, 2009; Mishra & Lalumiere, 2011; Olson, Hooper, Collins, & Luciana, 2007; Shead & Hodgins, 2009; Takahashi, Takagishi, Nishinak, Makino, & Fukui, 2014). Therefore, probability discounting adds an element of risk not captured by delay discounting tasks, as probable outcomes are riskier than the certain outcomes and each should be measured and discussed separately.

### **Delay Discounting**

Delay discounting is a phenomenon where individuals make choices between a standard larger-later reward and an immediate reward, where the amount is adjusted until the participant subjectively considers the two amounts to be of approximately equal value. This process is repeated across a series of delays. Discounting paradigms often use money as the reward as it typically has the same objective value to all individuals (Johnson & Bruner, 2012). When given a choice between two monetary rewards that differ in only amount, an individual typically chooses the larger amount (e.g., \$10) over the smaller amount (e.g., \$6) (Green & Myerson, 2004). Similarly, when given a choice between the same amount of a more immediate reward (e.g., \$10 now), and a more delayed reward (e.g., \$10 in one week), an individual typically prefers the more immediately available option. Thus, the only variable that changes in the choice is how long an individual has to wait for the reward, or the delay. Within this paradigm, participants are asked if they would prefer a smaller-sooner choice (e.g., \$8 now) compared to a larger-later reward (e.g., \$10 in 1 day) at increasing delays (e.g., 1 day, 1 month, 2 months, 6 months, 1 year).

As the delay to the larger reward increases, its subjective value decreases until the larger, more delayed reward becomes subjectively equal to the smaller, more immediate reward (Anokhin et al, 2015; Ainslie, 1975; Green, Fristoe, & Myerson, 1994). This point of subjective equivalence is called the indifference point. For each delay, an indifference point is calculated when an individual's preference changes from the larger, later reward at the delay to the smaller, sooner reward. For each delay (e.g., 1 day, 1 week, 1 month, 1 year), an indifference point is calculated and a discounting pattern, or indifference curve, may be shown graphically by plotting individual (or group median) indifference points to represent a pattern of behavioral choices (Bickel & Marsch, 2001).

Discounting procedures often obtain multiple indifference points per individual based upon the number of delays within the particular discounting task (i.e., how many different time points one uses as an option for receipt of the larger, later reward). Although all humans discount the value of rewards, there are significant individual differences in discounting patterns that reflect patterns of choices during discounting tasks (Green, Fry, & Myerson, 1994). To accurately describe models of human delay discounting choices, a hyperbolic decay function proposed by Mazur (1987) can be used (de Wit, 2008; Kirby & Marakovic, 1996; Myerson, & Green, 1995). The hyperbolic decay function describes the shape of discounting patterns mathematically (Equation 1):

$$V = \frac{A}{1+kD}$$

In this model, the subjective value  $V$  represents the subjective value (i.e., the indifference point) of a delayed reward,  $A$  represents the amount of the large outcome, divided by the delay duration  $D$ . The discount rate,  $k$ , is a free parameter that indicates rate of discounting, or a tendency to prefer the smaller-sooner outcomes. Relatively large  $k$  values indicate steeper rates

of delay discounting and impulsive choice across delays. That is, a faster diminishment of the value of the large reward diminishes as a function of delay, and is implicated in behaviors categorized by impulsivity (i.e., problematic gambling, substance abuse, obesity, and other risky behaviors) (Anokhin et al, 2015; Ainslie, 1975; Arantes et al., 2013; Kirby, Petry, & Bickel, 1999; Bickel, 2001; Madden & Bickel, 2010). Larger  $k$  values, referred to as the preferred choice for smaller-sooner rewards across delays, are associated with future outcomes being perceived as less valuable than immediate outcomes (Bickel & Marsch, 2001; Kirby, 2009; Kirby, Petry, & Bickel, 1999; Mischel, 1966; Rachlin, Logue, Gibbon, & Frankel, 1986 Rotter 1954)). As such, when the preferred choices are delayed rewards, that is referred to as self-controlled.

### **Methodological Aspects of Discounting**

In laboratory research, most monetary discounting procedures are hypothetical, but participants may also receive real, or potentially real, outcomes based on their choices (Green & Myerson, 2004; Johnson & Bickel, 2002; Lawyer et al., 2011; Madden et al., 2003; Madden et al., 2004). Hypothetical reward choices are not given, but individuals are prompted to imagine they will be given the reward they choose. Within potentially real reward procedures the individual is provided a chance to actually receive one of their choices based on random trials within the task, where the individual receives the amount of money they choose within one of the tasks (Johnson & Bickel, 2002). Evidence suggests hypothetical rewards yield similar discounting patterns to potentially real (Baker et al., 2003; Johnson & Bickel, 2002; Lawyer, Schoepflin, Green, & Jenks, 2011) and real rewards (Lagorio & Madden, 2005).

Several types of delay discounting procedures exist, typically administered through computerized assessments. Some discounting tasks utilize mathematical, titration procedures, that automatically adjust based on one's choice (Richards et al, 1999). These computerized titration procedures require an individual to make several choices at one delay before reaching an

indifference point and can be lengthy for the participant. The indifference point values for each delay are found by incrementally adjusting (i.e., titrating) the smaller, immediately available reward up or down depending on an individual's responses to previous questions in the task. As such, each question narrows the range of values on consecutive trials until an indifference point is established. These procedures often vary in the number of indifference points required, resulting in different procedures requiring more or less time depending on the number of delays or the type of algorithm used to establish an indifference point.

More recent discounting tasks such as the discounting task established by Baker and colleagues (2003), which was adapted from Richards and colleagues (1999) task, obtains an indifference point more rapidly through the use of mathematical algorithms that use a double limit procedure. A double limit procedure identifies a lower and upper limit on the range of choices available for the smaller, sooner choice depending on the previous choices made. This procedure often obtains a faster estimate of discounting rates when there is systematic choice, and will reset for participants who may have nonsystematic or variance in how they are responding (i.e., choosing \$3 now over \$10 in one week after previously choosing \$6 now over \$10 in one week).

Delay discounting can also be conducted through more basic paper-and-pencil tasks, with a fixed set of choices. One such task that measures delay discounting includes the Monetary Choice Questionnaire (MCQ; Kirby & Marakovic, 1996). For this task, all participants view the same set of questions and it can be administered relatively quickly compared to some adjusting amount or titration procedures. The MCQ consist of 27 items based on a series of three sets of nine choices with differing larger reward amounts (i.e., where a participant chooses between a smaller, immediate amount, and a larger delayed amount). The MCQ was developed to calculate the value of the discounting rate parameter,  $k$ , for which the value of the delayed reward is equal

to the immediate reward. However, the MCQ has predetermined  $k$  values associated with each choice, rather than an indifference point being calculated (Kirby, 2009, Table 1). Thus,  $k$  serves as an index of impulsivity, with increasing values of  $k$  positively correlated with higher levels of impulsivity (Kirby, 2009; Kirby, Petry, & Bickel, 1999). Notably, methods of discounting completed through either the MCQ or titration procedures are strongly related and measure similar choice processes (Epstein et al., 2003).

Although titration procedures can obtain a more sensitive estimate of one's discounting pattern, the MCQ provides an efficient method of obtaining discounting patterns (Epstein et al., 2003). For this study, the MCQ is advantageous because it can be used in settings without computer access for research, such as in jails or prisons because it is not computerized. Additionally, the MCQ has previously been used with offender populations and will provide a sufficient estimate of an individual's degree of behavioral choice within an incarcerated setting and has strong psychometric properties (Kirby, 2009; Kirby & Petry, 2004; Kirby, Petry, & Bickel, 1999) and has been utilized in several populations.

Studies utilizing the MCQ (Kirby & Marakovic, 1996) have shown steeper discounting patterns for males, individuals who abuse substance (i.e., alcohol, heroin, cigarettes), criminals, and individuals who have been diagnosed with conduct disorder (Kirby, 2009; Kirby & Marakovic, 1996; Kirby, Petry, & Bickel, 1999; 2011; Varghese, Charlton, Wood, & Trower, 2014). When undergraduates were given the MCQ (Kirby et al., 1999) with real outcomes, discounting significantly correlated with risky behaviors such as sensation seeking, copying homework as a child, and speeding as an adult (Mishra & Lalumiere, 2011). Importantly, behavioral discounting tasks measure patterns of choice associated with a range of socially important, problematic, behavioral outcomes (e.g., substance use, gambling, risky sexual behaviors, obesity, and criminal thinking) in society (Critchfield & Kollins, 2001; Darjotis &

Johnson, 2015; Fields, Sabet, & Reynolds, 2013; Hendrickson & Rasmussen, 2013; Holt, Newquist, Smits, & Tiry, 2013; Johnson, Johnson, Herrmann, & Sweeney, 2015; Lawyer & Schoepflin, 2013; Lawyer, Schoepflin, Green, & Jenks, 2011; Varghese et al., 2014).

To date, Varghese and colleagues (2014) are the only researchers to examine the relationship between behavioral discounting and criminal thinking and they found a relationship between delay discounting and different types of criminal thinking patterns. They analyzed data from 146 inmates within 5 months of release from state prison. Participants completed the monetary choice questionnaire (MCQ) and the Psychological Inventory of Criminal Thinking (PICTS). The researchers found the MCQ produced valid data in incarcerated offenders and discounting was positively correlated with the reactive criminal thinking scale ( $r = .19, p < .05$ ), but not with the proactive criminal thinking scale ( $r \leq .09, p > .05$ ). Therefore, results suggested that different cognitive processes may be involved in different types of criminal thinking patterns.

### **Probability Discounting**

Probability discounting tasks are similar to delay discounting tasks, except participants choose between a series of smaller certain, for sure amounts, and larger, less probable, uncertain rewards. For example, a participant would be asked to choose their preference between a certain amount of money or larger amount of money presented probabilistically through the question, “Would you prefer \$20 for sure or a 10% chance of winning \$80?” An indifference point is established when the subjective value of a probabilistic reward is subjectively equal to the certain reward such as when a certain reward (e.g., \$5) and an uncertain reward (e.g., 50% chance of \$10) would be chosen equally across probabilities.

Similar to delay discounting, the indifference point values obtained in probability



discounting tasks are also well described by a hyperbolic discounting function:

$$V = \frac{A}{1+hO}$$

where  $V$  represents the subjective value (i.e., indifference point) of the probabilistic reward,  $A$  represents the amount of the larger probabilistic reward,  $O$  represents the odds against receiving the larger probabilistic reward  $[(1/p)-1]$  where  $p$  represents the probability of receiving the large outcome, and  $h$  represents the rate at which the value of the probabilistic reward is discounted (Rachlin, Raineri, & Cross, 1991; Rasmussen, Lawyer, & Reilly, 2010). Smaller  $h$  values in probability discounting indicate a preference for probabilistic (i.e., riskier) outcomes across probabilities, whereas higher  $h$  values represent a preference for more certain outcomes.

Probability discounting tasks includes an element of uncertainty that is associated with impulsive risk-taking behaviors suggesting individuals who discount probabilistic rewards more steeply take greater risks to obtain rewards (Madden, Petry, & Johnson, 2009). As such, individuals' choices on probability discounting tasks reflect their response patterns towards risk-taking, or behaviors with probabilistic outcomes, and can be presented graphically (Shead & Hodgins, 2009). Individuals with choices indicating higher subjective values are associated with choices of risk-seeking. In other words, risk-seeking individuals prefer larger, probabilistic rewards (lower  $h$  values) over smaller, certain rewards.

### **Adolescence, Discounting, and Childhood Maltreatment**

A developmental trend toward increased self-control has been found in the delay discounting literature as individuals age. Children show the steepest discounting and older adults show the most self-controlled discounting patterns (Green, Fry, & Myerson, 1994; Green, Myerson, & Ostaszewski, 1999). When adolescents are compared to young adults, adolescents are found to be steeper discounters, indicating development may play a role in discounting

behavior. When comparing groups of adolescents, other environmental factors may affect discounting patterns. Wilson and Daly (2006) compared 91 young juvenile offenders and 284 high school students and failed to find a difference between discounting rates for money. However, Konecky and Lawyer (2015) found that adolescents who were recruited from juvenile drug court who met criteria for substance abuse or dependence had significantly higher rates of delay discounting on the Monetary Choice Questionnaire (MCQ; Kirby, 1999) than did non-drug abusing controls from the community. These difference in the rates of discounting between the groups of adolescents indicated substance use was associated with discounting.

Despite research depicting discounting is steeper due to substance use, contrasting research has shown discounting future rewards cannot be solely attributed to substance use, as steeper discounting often precedes substance use and may be due to genetics, abnormalities in developmental (i.e., neural abnormalities related to executive functioning), or age (Anokhin et al., 2015; Arantes et al., 2015; Baglivio et al., 2015; de Wit, 2008; Green, Fry, & Myerson, 1994). In sum, previous research does not take into account previous developmental histories including childhood maltreatment or conflictual family dynamics that influence decision making, or risky behaviors (i.e., substance use).

### **Childhood Maltreatment and Impulsivity**

Childhood maltreatment also has a strong relationship with antisocial behavior. Dargis and colleagues (2016) sampled incarcerated men and demonstrated the severity of childhood maltreatment is associated with the severity of psychopathy and antisocial personality disorder in adulthood. Therefore, childhood abuse (e.g., physical abuse, physical neglect, and emotional abuse) is related to constructs that make up conduct disorder and antisocial personality disorder and include constructs such as impulsiveness, aggression, risk-taking, and failure to consider negative consequences in adulthood.

There is a strong relationship between childhood maltreatment and antisocial behaviors, including the propensity to engage in risky behaviors (i.e., substance use) during adolescence. Substance use in adolescents is consistently a predictor of later problematic outcomes such as other drug use and violence. In a retrospective cohort study of 8,417 participants from an original ACE study, Dube, et al. (2016) examined the relationship between ACEs and both the likelihood of ever drinking and the age of initiating alcohol. They found that each ACE, except physical neglect, increased the risk of ever using alcohol and the risk of using alcohol by age 14 increased 2-3 times due to experiencing an ACE. The relationship with cumulative ACEs (i.e., four or more) were 3 times more likely to have reported using alcohol. Adolescents who engage in alcohol use also report other risky decisions including drug use, violence and aggression, sexual risk taking, and suicidal ideation. Substance use in adolescence may disrupt the neural connections impacting the underlying mechanisms for decision making, thus controlling for substance use when examining childhood maltreatment is an important consideration within the context of adult outcomes.

Within a juvenile offender population, early onset and serious, violent, and chronic offending styles are significantly predicted by a higher number of ACEs (more than 5), even after controlling for mental health and substance use (Baglivio et al., 2015; Fox et al., 2015). A strong relationship between initiating alcohol use in early adolescence provides evidence for the impact of these early traumatic experiences prior to the use of substances. In a large nationally representative sample (N=34,653), Roos et al. (2016) determined childhood maltreatment predicted incarceration during adulthood, even after controlling for substance use problems. Early weaknesses in an adolescent's WM has predicted increased risky behavior and deficits in WM come prior to initiating substance use in adolescence (Romer et al., 2011). Thus, the role of WM within the PFC appears to impact risk behaviors in adolescents. It is important to recognize

substance use may add to the expression of risky behaviors, aggression, and violence. However, childhood maltreatment and possibly the structural and functional changes of the brain appear to be fundamental factors associated with juvenile and adult offending behavior (Dargis et al., 2016).

### **Discounting, the Prefrontal Cortex, and Criminal Thinking**

Studies conducted on the neural correlates of decision making indicate that parts of the limbic system and prefrontal cortex (PFC) are activated to control impulsive behaviors (McClure, Laibson, Loewenstein, and Cohen, 2004; Kim & Lee, 2011). These neuroimaging studies indicate within temporal discounting tasks there is more activity in limbic areas (i.e., amygdala) for choices that include immediate outcomes and greater activation in the lateral PFC when an intertemporal choice for a delayed outcome is made in humans. In a rodent study, when the medial PFC and basolateral amygdala was disconnected the rodents became more impulsive resulting in choices for more immediate outcomes (Churchwell, Morris, Heurtelou, & Kesner, 2009). Similarly, Figner and colleagues (2010) momentarily disrupted the lateral-PFC through repetitive transcranial magnetic stimulation (rTMS) in humans that were making temporal choices which resulted in increased choice for the immediately available rewards. Thus, the PFC is integral to self-control processes and impairment in decision-making and self-control is evidenced through lesions or dysfunction to portions of the PFC and limbic system (Bickel et al., 2007; Figner et al., 2010; Kim & Lee, 2011).

Disruption to the PFC and limbic system through either dysfunction, traumatic brain injury, or lesion results in maladaptive behavior and possible negative outcomes (Bickel et al., 2007). The PFC is involved in both delay and probability discounting. Within delay discounting, the disconnection of the PFC and limbic system in rats led to an overestimation of elapsed time during reward anticipation (Churchwell et al., 2009). In humans, Baumann and Odum (2012)

evaluated the relationship between the degree of delay discounting with temporal perception, or the perception of time passing. The findings indicated that more impulsive individuals tended to overestimate how much time had passed, which is consistent with animal findings. As such, impulsive individuals, or steeper discounters, may perceive a delay as longer compared to a more self-controlled individual, which in turn effects the value of the reward (Baumann & Odum, 2012; Churchwell et al., 2009). Within a sample of university students, Loughran, Paternoster and Weiss (2012) examined the decision to commit a crime (e.g., driving while intoxicated) as an intertemporal choice. The researchers found individuals have a time preference for both rewards and gains, and discounting behavior independently changes when the risk of detection for driving drunk is certain (Loughran, Paternoster, & Weiss, 2012).

Richards and colleagues (1999) found components of impulsivity to be associated with both delay and probability discounting; results from this study indicated individuals who steeply discount delayed rewards were also more likely to demonstrate steeper discounting for probabilistic rewards. Consistently, steeper delay discounting, is associated with individuals who are more impulsive and are associated with engaging in substance use, addictive behaviors, criminal behavior, or are diagnosed with clinical disorders (MacKillop et al., 2011; Petry, 2002). Petry (2002) found individuals who abuse substances with a comorbid diagnosis of antisocial personality disorder (APD) discounted delayed rewards more steeply than substance users without APD. The author argues steeper discounting rates of individuals with comorbid substance abuse and APD is related to delinquency because of the temporal distance between perceived consequences of criminal behavior. An individual with criminogenic thinking may have an impaired ability to accurately assess the time until a delayed reward or consequence, making an immediate reward more tempting. Thus, delay discounting is a measure that may be indicative of how individuals who perceive consequences as certainly delayed (e.g., going to

prison for a crime) have more difficulty controlling behavior that is distant from the immediate reward and may be related to criminal decision making and deterrence (Loughran, Paternoster, & Weiss, 2012).

Similarly, probability discounting is associated with externalizing behaviors (i.e., rule breaking, substance abuse), aggressive behaviors (i.e., arguing, threatening others), and risky decision making (Olson, Hooper, Collins, & Luciana, 2007). Probability discounting is a measure that may be indicative of how individuals make decisions when outcomes are riskier, and uncertain (e.g., being caught for a crime). In adolescents, individuals assessed to possess traits of narcissism (i.e., entitlement) significantly discounted probabilistic rewards and engaged in more thrill-seeking behavior (Malesza & Ostaszewski, 2016). In adults, risky decision making was examined by comparing incarcerated offenders to ex-offenders on risk-taking behaviors (Gummerum, Hanoch, & Rolison, 2014; Rolison, Hanoch, & Gummerum, 2013). Rolison and colleagues (2013) had offenders and ex-prisoners make choices between monetary sums that could be won or lost and found ex-prisoners make riskier choices. Similarly, the researchers found ex-prisoners report engaging in more risk-taking activities (Gummerum, Hanoch, & Rolison, 2014). Therefore, the researchers concluded risky decision making for ex-prisoners may be more about the expected benefits rather than the risk of consequences when it comes to risk decision making.

Decision making in criminals may be further implicated based on dysfunction or differences in their neural substrates. One study examined decision making between two groups of offenders that were grouped as either emotional hypo-reactive (i.e., callousness, lack of fear, empathy, and remorse) or hyper-reactive (i.e., reactive aggression in defense to threat) and compared them to healthy adult controls on a risk-taking (e.g., choosing between low-risk bonds and high-risk stocks) task (Prehn et al., 2013). The researchers found emotionally hypo-reactive

offenders differed the most from controls by showing decreased neural activity in the PFC when regulating their behavior by choosing the low-risk options suggesting these offenders, typically labeled as psychopaths, have limited abilities to anticipate punishment and difficulty controlling their behavior. Thus, identifying the mechanisms that underlie criminal thinking (i.e., impulsivity and risk-taking) allows researchers and treatment providers to identify cognitive skills that improve long-term decision-making skills as well as help improve problem-solving abilities and recognizing consequences.

One way of improving our understanding of criminogenic thinking is to better characterize the relationship between impulsive choice, risk-taking, and criminal thinking. To date, several studies have used the discounting paradigm to characterize impulsive choice among criminal offenders. In a New Zealand sample, rates of delay discounting resulted in steeper discounting among adult offenders in medium security facilities compared to non-offenders, even after controlling for substance use (Arantes et al., 2013). Poncinie (2013) compared eight male sex offenders with a dual diagnosis of either a mental health disorder or a developmental disorder to eight non-offending participants with a dual diagnosis on their discounting choices for money and food across seven delays. He found that sex offenders with a dual diagnosis discounted delayed rewards more steeply than the non-offending group for both monetary and edible rewards.

Although researchers have identified delay discounting is related to criminogenic thinking, more research needs to be conducted examining these relationships to help establish the underlying mechanisms of criminal thought patterns. One of the only published studies to date examining behavioral discounting and criminal thinking in an offender population was conducted by Varghese and colleagues (2014). Varghese and colleagues (2014) sampled 146 male inmates within 5 months of release by examining delay discounting through the use of the

Monetary Choice Questionnaire (Kirby, 1999) and criminal thinking through the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995). Within this study, the researchers distinguished between the two different aspects of general criminal thinking within the PICTS, including proactive (i.e., calculated and planned) and reactive (i.e., spontaneity, opportunity, rashness, and impulsivity) criminal thinking. Results indicated delay discounting was correlated with reactive criminal thinking, but was not correlated with proactive criminal thinking (Varghese et al., 2014). Therefore, it may be assumed different underlying cognitive processes may be involved in reactive, compared to proactive, types of criminal thinking.

### **Present Study**

The current study explores the relationship between childhood maltreatment, impulsivity, and criminal thinking in a sample of adult men incarcerated in jail. This research aims to determine if there is a relationship between childhood maltreatment experiences and general, proactive, and reactive criminal thinking styles (Cuadra et al., 2014) as well as to replicate Varghese and colleague's (2014) findings by determining if there is a relationship between delay discounting and general and reactive criminal thinking. This study extends the findings of these two previous studies by combining the variables of childhood maltreatment, impulsivity, and criminal thinking. Specifically, this study addresses whether impulsive choice as measured through delay discounting, mediates the relationship between childhood maltreatment and criminal thinking in adult males incarcerated in jail.

This research extends previous findings by including a measure of decision making that addressed the propensity of risk-taking in incarcerated individuals (i.e., probability discounting questionnaire, Madden et al., 2009). Therefore, the research aims to identify if the propensity of risk taking, measured by probability discounting, mediates the relationship between childhood maltreatment and criminal thinking in adult male inmates.



The present study expected to find increased levels of childhood maltreatment experiences and increased  $k$  values predict increased levels of general, reactive (i.e., impulsive), and proactive (i.e., calculated) criminal thinking in an incarcerated population. Research on childhood maltreatment, impulsivity, and criminal thinking will add to the literature on long-term adult outcomes and may be helpful to promote awareness to parents, primary care providers, and clinicians that early adverse experiences need to be taken into consideration.

The following hypotheses were formulated based upon the aforementioned literature:

### **Hypotheses:**

Hypothesis 1: It is expected that increased severity of childhood maltreatment and increased  $k$  values on monetary delay and lower  $h$  values on probability discounting tasks would predict increased levels of general criminal thinking in incarcerated men after controlling for age, education, and alcohol and drug use (Cuadra et al., 2014).

1.1: It is expected that incarcerated men with higher levels of overall maltreatment severity would be associated with increased general, reactive, and proactive criminal thinking on the PICTS as previously shown by research, after controlling for substance use similar to previous research (Cuadra et al., 2014).

1.2: It is predicted that incarcerated men with higher  $k$  values on delay discounting tasks for monetary outcomes would be associated with higher scores on the general and reactive criminal thinking scales on the PICTS, but not with the proactive criminal thinking scale on the PICTS after controlling for substance use, similar to previous research (Varghese et al., 2014).

1.3: Incarcerated men with lower  $h$  values on probability discounting tasks for monetary outcomes would be associated with higher scores on the general and reactive criminal

thinking scales of the PICTS, but not with the proactive criminal thinking scale of the PICTS after controlling for substance use.

Hypothesis 2: Delay discounting for monetary outcomes is expected to mediate the relationship between childhood maltreatment and criminal thinking after controlling for age, education, and drug use.

Hypothesis 3: Probability discounting for monetary outcomes is expected to mediate the relationship between childhood maltreatment and criminal thinking after controlling for age, education, and drug use.

### **Method**

All established requirements and ethical standards for the use of human research subjects set forth by the Idaho State University (ISU) Institutional Review Board (IRB) were met.

#### **Participants**

Participants were 125 adult male inmates recruited from Bannock and Bonneville County Jails in Southeastern Idaho. Inclusionary criteria for analyses included being at least 18 years of age, incarcerated in either Bannock County or Bonneville County Jail, and proficient in English determined by a research assistant. Participants were compensated for their time by receiving one candy bar (which was consumed during the interview due to jail rules) in Bonneville County or one free 15-minute phone call in Bannock County, despite if they complete the entire study.

#### **Materials**

##### **Self-Report Measures**

Participants completed a survey packet consisting of several measures administered by a research assistant.

### **Demographics Questionnaire**

The demographics questionnaire inquired about participant age, ethnicity, educational level, employment status, marital status, and sexual orientation (see Appendix A). Participants reported the number of previous incarcerations in both jail or prison and current criminal charges and behavior. Objective criminal charges were also obtained and compared to participant subjective reports. Brief intelligence was assessed with the North American Adult Reading Test (NAART; Uttl, 2002) providing an estimate of verbal intelligence (see Appendix B).

### **Substance Use Questionnaire**

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; see Appendix C) is a 7-item questionnaire developed by the World Health Organization (2006) that assesses alcohol use and substance use for lifetime and past 3 months and is recommended to be used with prisoner populations. An overall score for alcohol and an overall score for drug use (i.e., ASSIST Specific Substance Involvement) was calculated. Additionally, each substance (i.e., cannabis, cocaine, amphetamine-type stimulants (ATS), sedatives and sleeping pills (benzodiazepines), hallucinogens, inhalants, opioids, and ‘other’ drugs) was measured independently. The ASSIST allows for identifying differences between alcohol and illicit drug use and was used as a covariate in this study. For this study, participants were asked about their alcohol and drug use during the three months prior to the current incarceration.

### **Childhood Maltreatment Questionnaire**

The *Maltreatment and Abuse Exposure Scale* (MAES; Teicher & Parigger, 2015; see Appendix D) is a 52-item measure designed to assess the number of types of maltreatment and overall severity of the 10 types of childhood maltreatment experiences including emotional neglect, non-verbal emotional abuse, parental physical maltreatment, parental verbal abuse, peer emotional abuse, peer physical bullying, physical neglect, sexual abuse, witnessing interparental

violence and witnessing violence to siblings. The MAES produces a multiplicity and a severity score. The Multiplicity score, or the number of different types of maltreatment reported, ranges from 0-10 through an item endorsed score (1 = yes, and 0 = no) of each type of maltreatment reported. MAES Severity, sums the individual severity scores for each type of maltreatment and is standardized based on the number of items endorsed in each category, thus severity scores range from 0-100 (Teicher & Parigger, 2015). In other words, based on the number of items endorsed in each type of maltreatment a scaled score is provided to determine severity. Each of the 10 maltreatment types have a scaled score ranging from 0-10, for example, there are 9 sexual abuse items, if 4 items on this subscale are endorsed, then the scaled score would be 4 out of 9 and this scoring process would continue for each maltreatment type resulting in a score from 0-100, with scores above 51 indicating higher severity.

The Maltreatment and Abuse Exposure Scale (MAES), was developed to address limitations of previous childhood maltreatment measures including the Adverse Childhood Experience Questionnaire (ACE; Felitti et al., 1998) and the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). As such, the MAES provides both a CTQ-like total severity score and an ACE-like multiplicity (number of types of maltreatment experienced) of exposure score (Teicher & Parigger, 2015). Thus, the measure was developed by incorporating items based on two psychometrically strong measures, and has established strong reliability and convergent validity with these measures. To date, few studies utilize the MAES however Teicher and Parigger (2015) indicate the measure has good to excellent test-retest reliability ( $r = .91$ , 95% confidence interval [CI] = [.86, .94]; Teicher & Parigger, 2015) for overall degree of exposure to individual types of maltreatment. The MAES severity score correlated strongly with the CTQ total score at .74, and the multiplicity score correlated with the ACE scale at .70. This measure

has been utilized to predict adult psychiatric symptoms (Capretto, 2016), and has been successfully translated in Brazil (Kluwe-Schiavon, Viola, & Grassi-Oliveira, 2016).

Overall, the number of maltreatment occurrences and the severity of maltreatment are recommended over attitudes and perceptions towards maltreatment events (Brewin, Andrews, Gotlib, 1993). According to Teicher and Parigger (2015), the MAES scores better predict psychiatric outcomes than the CTQ and the ACE scale. In a recent study utilizing the MAES, Capretto (2016) found the severity of child maltreatment was a stronger predictor of psychological symptoms in adults compared to the number of maltreatment experiences. These results are in accordance to other researchers who have indicated the use of severity of childhood maltreatment and adult outcomes (Baglivio et al., 2015; Dargis, 2016; Higgins & McCabe, 2000).

### **Behavioral Measures of Impulsivity**

#### *Monetary Choice Questionnaire*

The *Monetary Choice Questionnaire* (MCQ; Kirby et al., 1999; see Appendix E) is a 27-item, paper-and-pencil measure that allows for the quick estimation of a discount rate based on Mazur's (1987) discounting equation. The 27 questions are broken down into three magnitudes of nine questions each. Each of the 27 items on the MCQ asks participants to choose between either an immediately available reward or a larger, delayed reward. For example, the first item on the MCQ asks the respondent to choose between "\$54 right now" or "\$55 in 186 days" While completing the MCQ in this study, participants indicated their preference for either the immediate option or the delayed option for each choice pair to the research assistant.

The MCQ includes three sets of questions representing small (\$25-\$35), medium (\$55-\$60), and large (\$75-\$85) delayed outcomes. Discount rates for each of the three magnitudes are estimated by finding the point at which participants switch from a preference for the delayed

outcome to the more immediate outcome allowing for an estimate of the participant's  $k$  value for that magnitude (for more detail of how discount values are estimated using the MCQ, see Kirby et al., 1999, 2009). The MCQ will be scored by the automated scoring of the 27-item MCQ developed by Kaplan and colleagues (2016). The reliability, validity, and stability of the MCQ has been established (Kirby, 2009) and recently the MCQ produced valid data for incarcerated offenders in a previous study (Varghese et al., 2014).

### **The Probability Discounting Questionnaire**

The Probability Discounting Questionnaire is a 30-item, paper-and-pencil measure that allows for the quick estimation of probability discounting rate (Madden et al., 2009; see Appendix F). Participants indicated their preference for small but certain versus large but probabilistic rewards comprising small (\$60), medium (\$80), and large (\$100) magnitudes. Participants answered each question, and a research assistant circled their preferred outcome. One outcome will always be presented “for sure” and the other will be a larger amount of money presented probabilistically. For example, one item asks participants “Would you prefer \$20 for sure OR a 1-in-10 chance (10%) of winning \$80.” The probabilities and amount selected allow for a wide range of values and to assess the magnitude effect.

### **Criminal Thinking Questionnaire**

The *Psychological Inventory of Criminal Thinking Styles Version 4.0* (PICTS; Walters, 2013; see Appendix G) is an 80 item self-report measure assessing criminal thought processes. Each item is rated on a four-point Likert Scale. Participants chose from strongly agree (4), agree (3), uncertain (2), and disagree (1). Higher scores are indicative of a higher degree of criminal thinking, with clinically significant T scores greater than or equal to 55. The General Criminal Thinking (GCT) is the sum of the raw scores for Mo, Co, En, Po, So, Ci, and Ds; the P is calculated by summing the raw scores for Mo, En, Po, and So; and the R is calculated by

summing the raw scores for Co, Ci, and Ds (Walters, 2012b; Walters et al., 2011). Each thinking style scale is composed of eight items, with the remaining 16 items spread out over two validity scales (Confusion—Revised, Defensiveness—Revised) and a Fear of Change (FOC) scale. The GCT is comprised of two subscales, proactive and reactive criminal thinking. For the General, Proactive, and Reactive Thinking Scales raw scores range from 56 to 224, 32 to 128, and 24 to 96, respectively. Standard scores for the General, Proactive, and Reactive Thinking Scales ranged from 34-103, 35-107, and 37 to 90, respectively. The GCT has strong internal consistency ( $\alpha = .90$ ), good test-retest reliability (12-week test-retest reliability [ $r$ ] = .81-.87). The PICTS has been used in numerous studies of criminal thinking (Cuadra et al., 2014; Walters, 1999, 2002, 2014, 2015 Walters & Lowenkamp, 2016; Varghese et al., 2014) and predicts recidivism beyond previous risk factors including age and criminal history (Walters, 2014; Walters, 2015a; Walters & Lowenkamp, 2016).

## **Procedures**

This study was approved by the Institutional Review Board at Idaho State University. Male English-speaking inmates at Bannock and Bonneville County Jail were recruited for a study concerned with “stressful childhood experiences and decision making (see Appendix H).” Participants were provided with an overview of the study procedures including a description of the approximate duration, types of questions asked, and the voluntary nature of participation. They were informed their participation was voluntary, anonymous, and participation would have no effect on their legal status or standing within the facility and refusal to participate would not be associated with any negative consequences. Data were used for research purposes only and kept confidential with responses being stored separately from any identifying information. All inmates were eligible to participate regardless of their offense.

Each participant was provided with an informed consent document written at a sixth-grade reading level, as the reading comprehension of this population has been found to be limited (see Appendix I). Collection of data took place individually in a secure location within the institution by trained graduate research assistants. All measures were read aloud to participants and their responses were entered into SPSS software by the author. Following the study procedures, participants were debriefed and given an opportunity to report any distress they experienced and shared concerns or questions they had about the study. They also were provided the contact information for the primary investigators and supervisor in the event they experienced lasting distress associated with participation.

## **Results**

### **Descriptive Statistics**

Overall, 215 individuals were approached to participate in the study. Sixty-seven (31.16%) individuals declined to participate, one individual did not speak English (.4%) and was excluded, and 22 (10.23%) individuals were not available due to work release (4.19%), behavioral issues (4.19%), or other circumstances not disclosed (1.86%). Thus, the sample consisted of 125 (58.14%) men incarcerated in jail. Participants ranged in age from 18 to 80 years of age ( $M = 34.17$  years;  $SD = 11.17$ ). The sample primarily identified as White, single, and heterosexual. The sample reported their highest level of educational training completed which ranged from 5 to 16 years of education ( $M = 11.51$ ,  $SD = 1.91$ ) with the majority of participants (51.2%) obtaining a high school diploma or General Education Diploma (GED). Scores on the brief verbal measure of intelligence, the NAART, ranged from 81 to 116.10 ( $M = 99.36$ ,  $SD = 8.03$ ). In addition, over half of the sample (76.8%) disclosed some form of employment prior to their incarceration, with the vast majority of the sample reporting full-time employment. With regard to their history of incarceration, the number of self-reported previous



incarcerations in prison/jail ranged from 0 to 200 ( $M = 13.44$ ;  $SD = 21.72$ ). Demographic information is presented in Table 1 with additional education information in Table 2.

Table 1

*Demographic Composition of the Sample.*

| <b>Demographic Variable</b>     | <b>N</b> | <b>%</b> |
|---------------------------------|----------|----------|
| Ethnicity                       |          |          |
| European American/Caucasian     | 82       | 65.6     |
| Native American/American Indian | 14       | 11.2     |
| Asian American/Asian            | 2        | 1.6      |
| Hispanic American/Latino        | 18       | 14.4     |
| African American                | 2        | 1.6      |
| Biracial                        | 6        | 4.8      |
| Other Ethnicity                 | 1        | .8       |
| Sexual Orientation              |          |          |
| Heterosexual                    | 122      | 97.6     |
| Homosexual/Gay                  | 1        | .8       |
| Bisexual                        | 2        | 1.6      |
| Education                       |          |          |
| Less than High School Degree    | 21       | 16.8     |
| Completed High School/GED       | 64       | 51.2     |
| Some College                    | 25       | 20.0     |
| Associate's Degree              | 11       | 8.8      |
| Bachelor's Degree               | 4        | 3.2      |
| Employment                      |          |          |
| Full-time                       | 78       | 62.4     |
| Part-time                       | 18       | 14.4     |
| Unemployed                      | 26       | 20.8     |
| Retired/Disability              | 3        | 2.4      |
| Relationship Status             |          |          |
| Single                          | 66       | 52.8     |
| Dating Relationship             | 13       | 10.4     |
| Married                         | 13       | 10.4     |
| Divorced/Separated              | 32       | 25.6     |
| Widowed                         | 1        | .8       |

Table 2

*Educational Level prior to Obtaining General Education Diploma (GED).*

| <b>Education Level</b>              | <b>N</b> | <b>%</b> |
|-------------------------------------|----------|----------|
| 8 <sup>th</sup> grade / Below       | 8        | 6.4%     |
| 9 <sup>th</sup> grade               | 11       | 8.8%     |
| 10 <sup>th</sup> grade              | 13       | 10.4%    |
| 11 <sup>th</sup> grade              | 24       | 19.2%    |
| 12 <sup>th</sup> grade (Incomplete) | 5        | 4.1%     |
| 12 <sup>th</sup> grade (Graduated)  | 24       | 19.2%    |
| Attended Some College               | 25       | 20%      |
| Associate's Degree                  | 11       | 8.8%     |
| Bachelor's Degree                   | 4        | 3.2%     |

Note. 67.2% of participants who reportedly did not complete high school obtained their GED.

Individuals reported the charge for which they were incarcerated and the objective charge was identified through the Idaho Repository. When comparing participant self-report to the repository, 88.8% of participant responses accurately matched the objective charge listed on the repository. Participants most frequently were in jail for drug offenses such as possession, delivery, or manufacturing (37.2%) as the charge for which they were currently incarcerated. Following drug offenses were crimes associated with theft (i.e., theft, burglary, robbery, fraud, forgery) and assault (i.e., battery, domestic violence). Information on the types of crimes committed is presented in Table 3.

Table 3

*Criminal Charge for Current Incarceration.*

| <b>Type of Criminal Charge</b>                   | <b>N</b> | <b>%</b> |
|--------------------------------------------------|----------|----------|
| Drug Offense                                     | 46       | 36.8     |
| Theft/Burglary/Forgery                           | 30       | 24.0     |
| Assault/Battery/Domestic Violence                | 21       | 16.8     |
| DUI                                              | 11       | 8.8      |
| Sexual Offense/Injury to Child/Rape/Lewd Conduct | 9        | 7.2      |
| Murder/Homicide                                  | 2        | 1.6      |
| Other                                            | 6        | 4.8      |

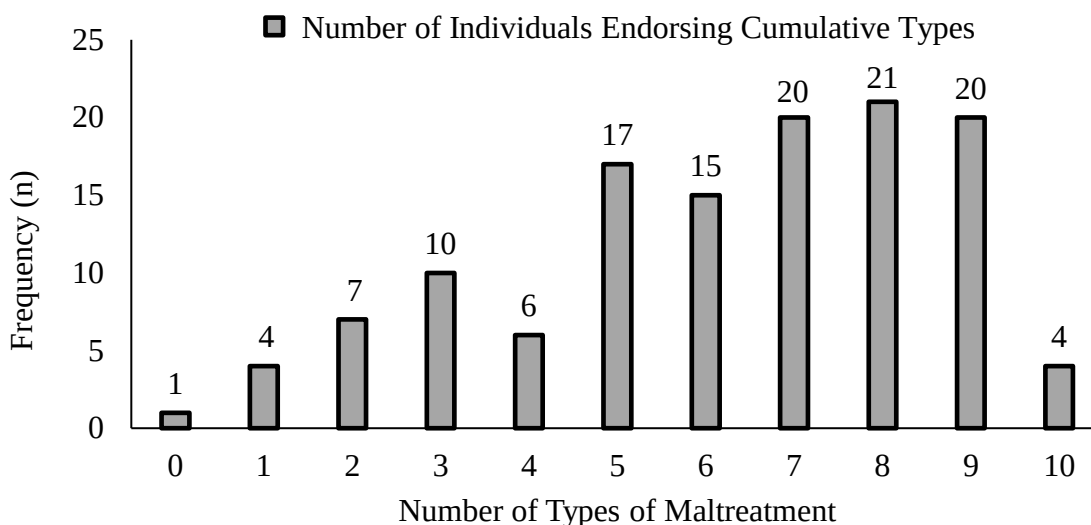
Note. N = 125

**Childhood Maltreatment**

With regard to childhood maltreatment experiences, all but one person reported experiencing some form of childhood maltreatment on the MAES (out of 10 types). 77.6% of participants reported experiencing five or more types of abuse, 4.8% of participants reported four types of maltreatment, 8% reported three types of maltreatment, 5.6% reported two types of maltreatment, 3.2% of participants reported one type of maltreatment, and one (.8%) participant did not report any maltreatment experiences. Figure 1 displays the number of types of maltreatment endorsed by each individual.

Figure 1

*Frequency of the Cumulative Number of Types of MAES Maltreatment Endorsed.*

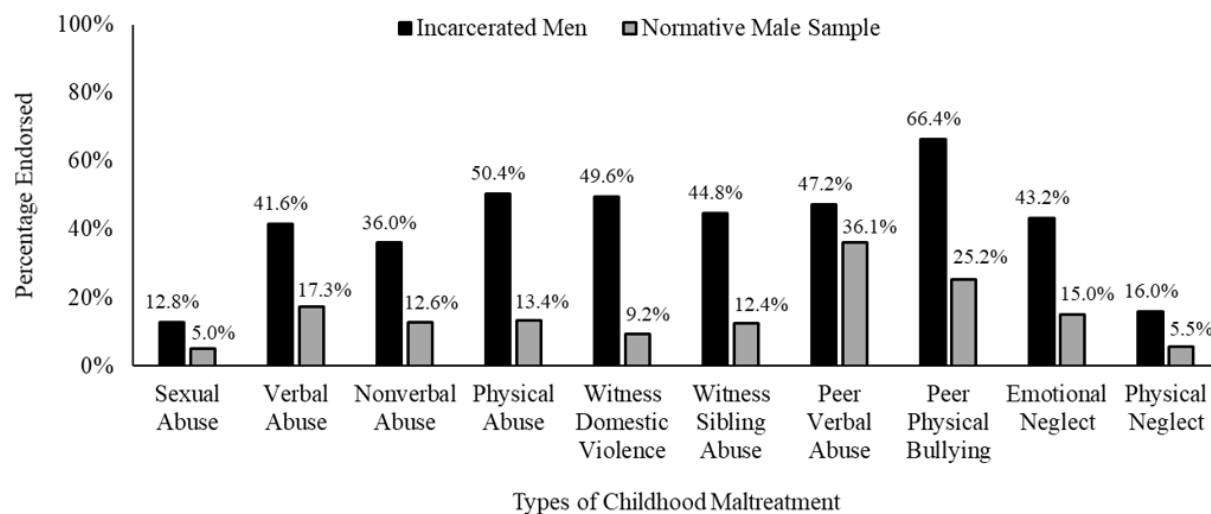


Note: N = 125

Compared to the normative sample, each of the 10 types of maltreatment endorsed in the current sample are significantly higher than the normative group (Teicher & Parigger, 2015). Analyses of the specific types of maltreatment indicated approximately half of the participants endorsed experiencing peer physical bullying (66.4%), parental physical maltreatment (50.4%), had witnessed violence between adults (49.6%), peer verbal abuse (47.2%), witnessing abuse towards siblings (44.8%), emotional neglect (43.2%), and parental verbal abuse (41.6%). A smaller percentage of the sample experienced parental nonverbal abuse (36%), physical neglect (16%), and sexual abuse (12.8%). Results from the current study compared to a normative male sample (Teicher and Parigger, 2015) are presented in Figure 2.

Figure 2

*Percentage of Sample (Men Incarcerated in Jail) who Endorsed Types of Maltreatment per the Cutoff Scores on the MAES Compared to the Normative Male Sample.*



Note. The normative male sample is from Teicher and Parigger, 2015.

The MAES also produces a maltreatment severity score (i.e., 0-100) which ranged from 0 to 87 ( $M = 34.21$ ,  $SD = 19.96$ ) in this sample, with higher scores indicating more maltreatment severity. Descriptive statistics for maltreatment severity scores, and overall endorsement of MAES types of maltreatment, as well as for each type are presented in Table 4.

Table 4

*Descriptive Statistics for the Maltreatment and Abuse Exposure Scale (MAES).*

|                                        | <i>M</i> | <i>SD</i> | <b>Range</b> |
|----------------------------------------|----------|-----------|--------------|
| <b>MAES Severity</b>                   | 34.21    | 19.96     | 0 – 87       |
| <b>MAES Number of Types</b>            | 6.20     | 2.42      | 0 – 10       |
| <b>Types of Maltreatment</b>           |          |           | # of Items   |
| Familial & Nonfamilial Sexual Abuse    | .45      | 1.15      | 7            |
| Parental Verbal Abuse                  | 1.78     | 1.56      | 4            |
| Parental Nonverbal Abuse               | 2.62     | 1.94      | 6            |
| Parental Physical Maltreatment         | 3.19     | 1.98      | 6            |
| Witness Physical Abuse Between Parents | 1.67     | 1.68      | 5            |
| Witness Abuse Toward Siblings          | .68      | .94       | 5            |
| Peer Verbal Abuse                      | 3.07     | 1.74      | 4            |
| Peer Physical Bullying                 | 2.26     | 1.61      | 5            |
| Emotional Neglect                      | 1.35     | 1.25      | 5            |
| Physical Neglect                       | .58      | 1.01      | 5            |

Note. N = 125

### **Criminal Thinking**

The PICTS measured cognitive thinking patterns associated with criminal behavior producing one composite score, and two subscale scores. The data were analyzed for invalid responses on the PICTS and data from two participants on the PICTS were identified as having invalid responses on the defensiveness scale (*T* scores above 80); these participants were removed from analyses. Three cases with *T*-scores above 80 on the Confused-revised (Cf-r) or Infrequency (INF) scales were identified; however, these cases were retained in collaboration

with the author of the PICTS (Walters, 2013) as the scores were not above the recommended research cutoff ( $T = 100$ ) and the cases remained within the data set. Unstandardized (raw) scores, means, standard deviations, and the range of general, reactive, and proactive criminal thinking scores are presented in Table 5.

Table 5

*General, Reactive, and Proactive Criminal Thinking Raw Scores.*

|                              | <b>General Criminal Thinking</b> | <b>Reactive Criminal Thinking</b> | <b>Proactive Criminal Thinking</b> |
|------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| <b><i>M</i> (Raw Scores)</b> | 117.19                           | 56.95                             | 60.24                              |
| <b>SD</b>                    | 24.79                            | 13.61                             | 13.54                              |
| <b>Range</b>                 | 62 – 175                         | 24 – 89                           | 35 – 102                           |

Note.  $N = 123$ .

Overall standardized general criminal thinking scores ranged from 37 to 83 ( $M = 59.43$ ,  $SD = 10.12$ ), which were within one standard deviation of the means reported for the normed population (Walters, 2013). Clinically significant scores ( $T\text{-scores} \geq 55$ ) are indicative of the presence of a criminal lifestyle. Specifically, 73.2% ( $n = 90$ ) of offenders endorsed a belief system that was supportive of a criminal lifestyle. The PICTS also produced scores for reactive and proactive criminal thinking. Standardized reactive criminal thinking scores ranged from 37 to 85 ( $M = 60.93$ ,  $SD = 10.26$ ) with 70.7% ( $n = 87$ ) of the sample endorsing a clinically significant reactive cognitive process characterized by impulsivity, spontaneity, and opportunistic offending. Similarly, standardized proactive criminal thinking scores ranged from 37 to 88 ( $M = 56.18$ ,  $SD = 10.10$ ) with 51.2% ( $n = 63$ ) of the sample endorsing a clinically significant proactive cognitive process characterized by calculated and planned criminal thought

patterns. Standardized scores, means, standard deviation, range, and the percent of individuals endorsing a criminal lifestyle for general, reactive, and proactive criminal thinking patterns are presented in Table 6.

Table 6

*General, Reactive, and Proactive Criminal Thinking Standardized Scores.*

|                                           | <b>General Criminal Thinking</b> | <b>Reactive Criminal Thinking</b> | <b>Proactive Criminal Thinking</b> |
|-------------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| <b>M (Standardized)</b>                   | 59.43                            | 60.93                             | 56.18                              |
| <b>SD</b>                                 | 10.12                            | 10.26                             | 10.10                              |
| <b>Range</b>                              | 37 – 83                          | 37 – 85                           | 37 – 88                            |
| <b>% Endorsing Criminal Belief System</b> | 73.2% (n = 90)                   | 70.7% (n = 87)                    | 51.2% (n = 63)                     |

Note. N = 123. Clinically significant scores (T-scores  $\geq 55$ ) are indicative of the presence of a criminal lifestyle.

### **Delay and Probability Discounting**

Discounting data were analyzed for an examination of the overall consistency on the discounting measures. For the MCQ, almost all of the participants' choices for monetary outcomes were consistent across the MCQ small (98%), medium (97%), and large (98%) magnitudes. One participant was identified to have an overall consistency score below 75% due to inconsistent data on the medium magnitude. All data were included in the analyses. For the Probability Discounting Questionnaire, participants were 89.6% consistent on the small, 94.4% consistent on the medium, and 98.4% consistent on large outcomes. All cases were retained in the analyses. Given discounting rates produce non-normal distributions and skewness,  $k$  and  $h$  values were approximately normalized by taking the natural log of the values, or the geometric mean of the values. Overall discount rates were estimated from the pattern of choices

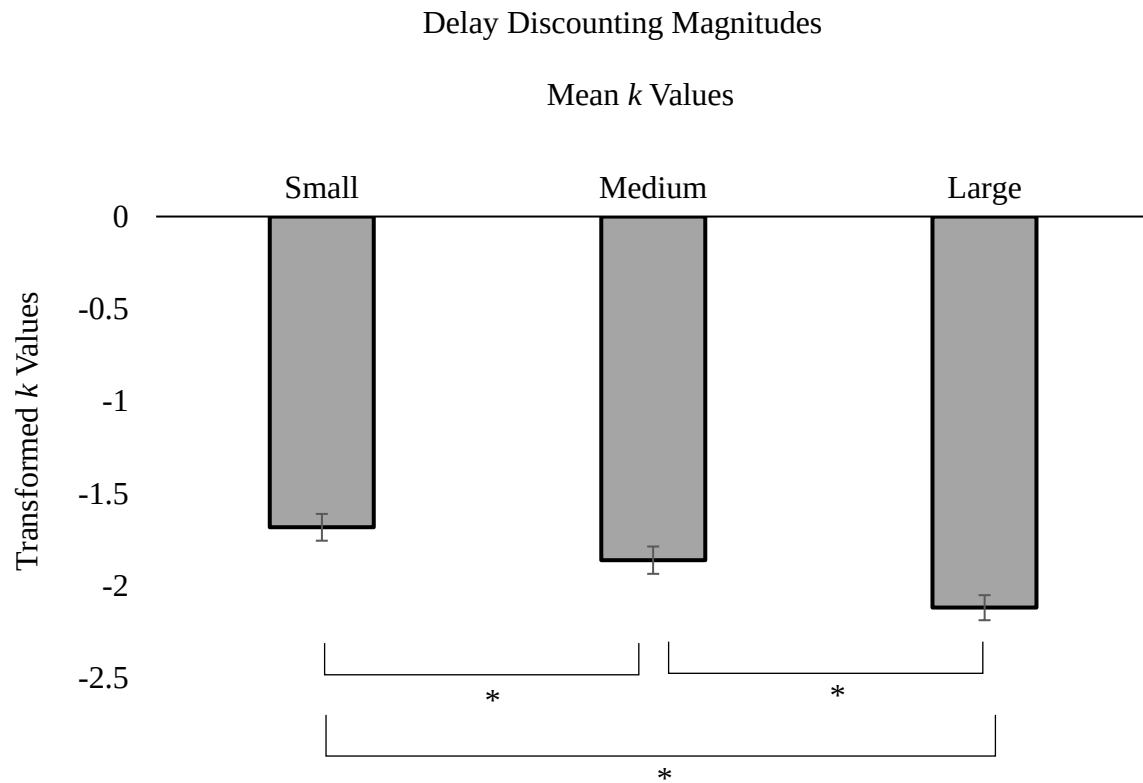


participants made across the small, medium, and large magnitudes, resulting in an overall geometric mean  $k$  value, which has been used in previous studies (Kirby et al., 2009). Data remained moderately positively skewed, but provides a better measure of central tendency for positively skewed data, such as discounting rates.

A repeated measures ANOVA was conducted to explore the effect magnitude had on monetary  $k$  values on the MCQ. The repeated measures ANOVA revealed a significant effect for magnitude,  $F(2, 248) 60.25, p < .001$ , partial  $\eta^2 = .33$ . A series of  $t$ -tests with a Bonferroni correction control for family wise type I error revealed significant differences were found between the small ( $M = -2.12$ ,  $SD = .76$ ) and medium ( $M = -1.86$ ,  $SD = .83$ ) magnitude,  $t(124) = 4.45, p < .01$ , small and large ( $M = -1.68$ ,  $SD = .81$ ) magnitude  $t(124) = 10.43, p < .01$ , and medium and large magnitude  $t(124) = 6.82, p < .01$  (see Figure 3). This indicates that, as expected, the discounting rate ( $k$ ) decreased with increasing reward magnitude, which is consistent with previous literature on hypothetical monetary gains (Baker, Johnson, & Bickel, 2003; Green, Myerson, & McFadden, 1997; Kirby et al., 1999; Raineri & Rachlin, 1993).

Figure 3

*Mean log 10 transformed k values by magnitude.*



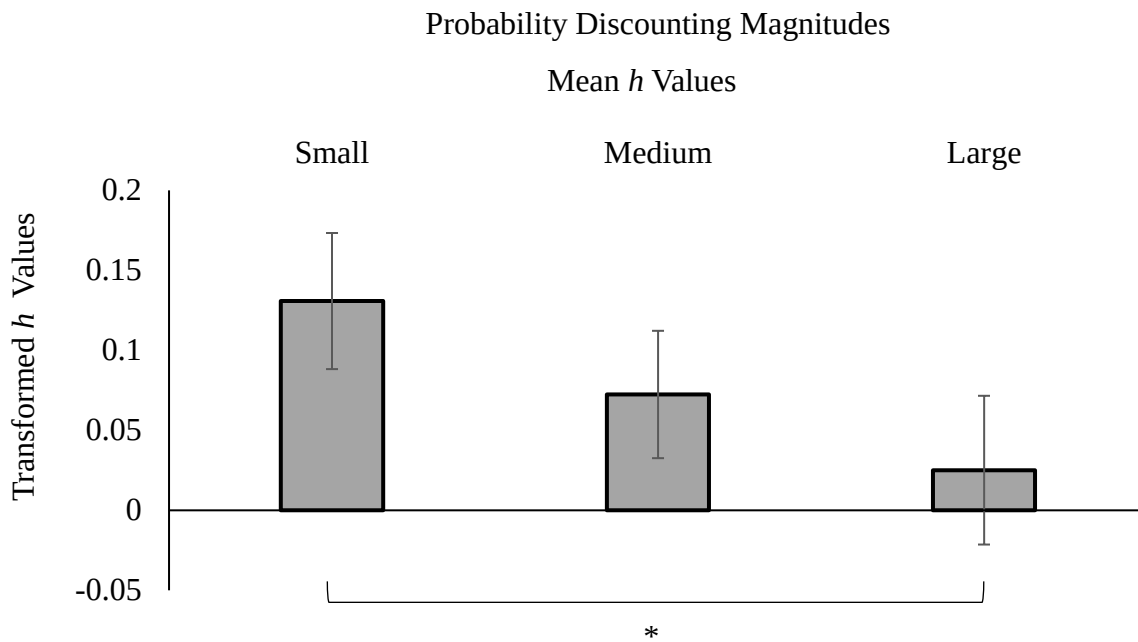
Note: \* indicates significance between magnitudes at  $p < .01$ . Error bars indicate standard error.

A second within-subjects ANOVA was conducted to explore the effect magnitude had on monetary  $h$  values on the Probability Discounting Questionnaire. Mauchly's test indicated that the assumption of Sphericity had been violated,  $X^2(2) = 16.13, p < .05$ , therefore the Greenhouse-Geisser correction was applied to the results ( $E = .82$ ). The repeated measures ANOVA revealed a significant effect for magnitude,  $F(2, 248) 3.96, p < .001$ , partial  $\eta^2 = .03$ . Overall,  $h$  values were smallest in the large magnitude ( $M = .03, SD = .52$ ). The  $h$  values increased at the medium magnitude ( $M = .07, SD = .45$ ) and increased again in the small magnitude ( $M = .13, SD = .48$ ). A series of t-tests were conducted upon all pair wise comparisons to test for the nature of this effect. A Bonferroni correction was used to fix the per comparison alpha rate at .017. Using this

modified alpha, significant differences were found only between the small and large magnitude,  $t(124) = 2.56, p = .01$ . No significant differences were found between the small and medium magnitude  $t(124) = 1.92, p > .01$ , nor the medium and large magnitude  $t(124) = 1.18, p > .01$  (see Figure 4). This suggests the probability discounting rate ( $h$ ) decreased from the small to the large magnitude but did not significantly decrease from the small to medium or medium to large magnitude. However, the overall pattern indicated a magnitude effect with the largest differences found between the large and small magnitudes.

Figure 4

*Mean log 10 transformed h values by magnitude.*



Note: \* indicates significance between magnitudes at  $p < .01$ . Error bars indicate standard error.

Results from this study sample were also compared to Varghese and colleagues (2014) by calculating an “Ftotal”, which was utilized by the authors to compare delay discounting and criminal thinking (rather than the geometric mean). An “Ftotal” score is the sum of all of the smaller-sooner values (i.e., ranging from 0 to 27) to provide a general estimate of overall discounting pooled across the three magnitudes and independent of magnitude. In the original study, the researchers found a significant relationship between the Ftotal score and reactive criminal thinking. Descriptive statistics of the Ftotal score indicated three individuals answered with all smaller-sooner responses. The mean Ftotal score for all participants was 15.82 (SD = 5.85), which was lower than the comparative sample ( $M = 18.14$ ; Varghese et al., 2014). A Spearman’s rho correlation was performed to compare the Ftotal with the general, reactive, and proactive criminal thinking scales and no significant relationships were found (similar to the delay discounting relationship described below).

### **Relationships Between Variables**

Correlation analyses were conducted to examine the relationship between criminal thinking and various potential predictors, including age, brief verbal intelligence, education levels, substance use (alcohol and drug use), childhood maltreatment, and impulsivity (delay and probability discounting). Table 7 summarizes the correlational relationships between variables. As expected, age, years of education, alcohol, and drug use were all significantly correlated with General, Reactive, and Proactive Criminal Thinking. Overall, the relationships indicated general, reactive, and proactive criminal thinking patterns decreased as the sample aged, had an increase in years of education, and had decreased drug and alcohol use. Childhood maltreatment severity was only significantly correlated with drug use severity, indicating as childhood maltreatment severity increased, so did drug use severity.

Table 7

*Pearson Correlations among Potential Predictors and Outcome Variables.*

| Measure                         | 1                 | 2                 | 3                | 4                | 5                 | 6   | 7    | 8                 | 9                | 10               | 11 |
|---------------------------------|-------------------|-------------------|------------------|------------------|-------------------|-----|------|-------------------|------------------|------------------|----|
| 1. Age                          | -                 |                   |                  |                  |                   |     |      |                   |                  |                  |    |
| 2. Years of Education           | .11               | -                 |                  |                  |                   |     |      |                   |                  |                  |    |
| 3. IQ                           | .14               | .33 <sup>b</sup>  | -                |                  |                   |     |      |                   |                  |                  |    |
| 4. Alcohol                      | -.19 <sup>a</sup> | -.26 <sup>b</sup> | -.02             | -                |                   |     |      |                   |                  |                  |    |
| 5. Drugs                        | -.35 <sup>b</sup> | -.16              | .02              | .21 <sup>a</sup> | -                 |     |      |                   |                  |                  |    |
| 6. Maltreatment Severity        | .06               | .06               | .19 <sup>a</sup> | .11              | .19 <sup>a</sup>  | -   |      |                   |                  |                  |    |
| 7. Transformed <i>k</i> values  | .04               | -.04              | .17              | .01              | .11               | .13 | -    |                   |                  |                  |    |
| 8. Transformed <i>h</i> values  | .11               | .08               | .00              | -.16             | -.20 <sup>a</sup> | .05 | -.04 | -                 |                  |                  |    |
| 9. General Criminal Thinking    | -.45 <sup>b</sup> | -.25 <sup>b</sup> | .02              | .26 <sup>b</sup> | .50 <sup>b</sup>  | .15 | .04  | -.36 <sup>b</sup> | -                |                  |    |
| 10. Reactive Criminal Thinking  | -.39 <sup>b</sup> | -.26 <sup>b</sup> | -.04             | .30 <sup>b</sup> | .46 <sup>b</sup>  | .16 | .05  | -.36 <sup>b</sup> | .91 <sup>b</sup> | -                |    |
| 11. Proactive Criminal Thinking | -.42 <sup>b</sup> | -.20 <sup>a</sup> | .07              | .18 <sup>a</sup> | .46 <sup>b</sup>  | .13 | .03  | -.30 <sup>b</sup> | .91 <sup>b</sup> | .67 <sup>b</sup> | -  |

<sup>a</sup> Correlation is significant at the 0.05 level<sup>b</sup> Correlation is significant at the 0.01 levelNote: *k* values refer to Delay Discounting, *h* values refer to Probability Discounting.

Delay discounting  $k$  values were not significantly correlated with any of the variables. Probability discounting  $h$  values, where lower values indicate increased risk-taking, were significantly negatively correlated with general, reactive, and proactive criminal thinking, and drug severity. Therefore, the risk-taking was associated with increased drug use severity, and increased general, reactive, and proactive criminal thinking. Table 8 summarizes the results of the correlational relationships between delay and probability discounting magnitudes and general, reactive, and proactive criminal thinking.

Table 8

*Correlations between Delay and Probability Discounting Magnitudes and General, Reactive, and Proactive Criminal Thinking.*

|                         | General           | Reactive          | Proactive         |
|-------------------------|-------------------|-------------------|-------------------|
| Delay Discounting       |                   |                   |                   |
| Small $k$ value         | .05               | .05               | .06               |
| Medium $k$ value        | .02               | .10               | .02               |
| Large $k$ value         | .03               | .05               | .02               |
| Probability Discounting |                   |                   |                   |
| Small $h$ value         | -.26 <sup>b</sup> | -.26 <sup>b</sup> | -.22 <sup>a</sup> |
| Medium $h$ value        | -.33 <sup>b</sup> | -.31 <sup>b</sup> | -.28 <sup>b</sup> |
| Large $h$ value         | -.33 <sup>b</sup> | -.36 <sup>b</sup> | -.25 <sup>b</sup> |

<sup>a</sup> Correlation is significant at the 0.05 level

<sup>b</sup> Correlation is significant at the 0.01 level

Due to childhood maltreatment type being an ordinal variable, a non-parametric Spearman's rho correlation established the relationships between childhood maltreatment types and general, reactive, and proactive criminal thinking types. The analysis indicated a significant positive correlation ( $r = .19, p < .05$ ) between maltreatment types and general criminal thinking, but not reactive or proactive criminal thinking. Therefore, general criminal thinking increased as the number of types of maltreatment experiences endorsed increased.

### **Hypothesis 1**

A sequential multiple regression was used to test hypothesis 1a that maltreatment severity,  $k$  values, and  $h$  values would predict variability in general criminal thinking above and beyond the contribution of age, years of education, alcohol use severity, and drug use severity. No cases had missing data, and there were no violations of regression assumptions. For the overall model (see Table 9),  $R^2$  was .453 and significantly different from 0 in each block, which indicated 45.3% of the variability in general criminal thinking could be explained by the combination of the predictors. Also, the change in  $R^2$  from block 1 to block 2 was significant,  $F(4, 118) = 18.58, p < .001$ ;  $F(7, 115) = 13.60, p < .001$ , supporting hypothesis 1 that maltreatment severity,  $k$  values, and  $h$  values would predict variability in general criminal thinking beyond what is predicted by age, years of education, alcohol use severity, and drug use severity. In particular, about 7% of the total variability in general criminal thinking can be explained by maltreatment severity,  $k$  values, and  $h$  values. An examination of the regression coefficients indicated age, drug use, and  $h$  values significantly contributed to the overall model. An increase in age decreased general criminal thinking scores, while an increase in drug use severity led to higher general criminal thinking scores, and lower  $h$  values (i.e., steeper discounting) led to higher general criminal thinking scores. Table 9 displays the unstandardized

regression coefficients (B), their standard error (SE), the standardized coefficients ( $\beta$ ), the 95% confidence interval for the unstandardized coefficients, and the change in  $R^2$  at each block of the model.

Table 9

*Hierarchical Multiple Regression Analysis Predicting General Criminal Thinking.*

| Order of Entry/Variable | B     | SE   | $\beta$ | <i>t</i>           | 95% CI for B   | $\Delta R^2$     |
|-------------------------|-------|------|---------|--------------------|----------------|------------------|
| Block 1                 |       |      |         |                    |                | .39 <sup>b</sup> |
| Age                     | -.26  | .07  | -.29    | -3.74 <sup>b</sup> | [-.40, -.12]   |                  |
| Years of Education      | -.74  | .39  | -.14    | -1.88              | [-1.52, .04]   |                  |
| Alcohol Use             | .63   | .54  | .09     | 1.17               | [-.43, 1.69]   |                  |
| Drug Use                | 1.31  | .26  | .39     | 5.00 <sup>b</sup>  | [.79, 1.83]    |                  |
| Block 2                 |       |      |         |                    |                | .07 <sup>b</sup> |
| Maltreatment Severity   | .06   | .04  | .11     | 1.52               | [-.02, .13]    |                  |
| <i>k</i> values         | -.20  | .93  | -.02    | -.21               | [-2.04, 1.64]  |                  |
| <i>h</i> values         | -6.16 | 1.73 | -.25    | -3.56 <sup>b</sup> | [-9.58, -2.73] |                  |

Note. N = 123 for all variables. Final  $R^2 = .453$ .

<sup>a</sup>  $p < .05$ . <sup>b</sup>  $p < .01$

A second sequential multiple regression was used to test hypothesis 1b that maltreatment severity, *k* values, and *h* values would predict variability in reactive criminal thinking above and beyond the contribution of age, years of education, alcohol use severity, and drug use severity. No cases had missing data, and there were no violations of regression assumptions. Table 10 displays the unstandardized regression coefficients (B), their standard error (SE), the



standardized coefficients ( $\beta$ ), the 95% confidence interval for the unstandardized coefficients, and the change in  $R^2$  at each block of the model. For this model,  $R^2$  was found to be .416 and significantly different from 0 in each block, which indicated 41.6% of variability in reactive criminal thinking could be explained by the combination of the predictors. Also, the change in  $R^2$  from block 1 to block 2 was significant,  $F(4, 118) = 15.65, p < .001$ ;  $F(7, 115) = 11.71, p < .001$ , supporting hypothesis 1b that maltreatment severity,  $k$  values, and  $h$  values would predict variability in reactive criminal thinking beyond what is predicted by age, years of education, alcohol use severity, and drug use severity. In particular, about 7% of the total variability in reactive criminal thinking can be explained by maltreatment severity,  $k$  values, and  $h$  values. An examination of the regression coefficients indicated age, drug use severity, and  $h$  values significantly contributed to the overall model. An increase in age decreased reactive criminal thinking scores, while an increase in drug use severity led to higher reactive criminal thinking scores, and lower  $h$  values (i.e., steeper discounting) led to higher reactive criminal thinking scores.

Table 10

*Hierarchical Multiple Regression Analysis Predicting Reactive Criminal Thinking.*

| Order of Entry/Variable | B     | SE   | $\beta$ | <i>t</i>           | 95% CI for B    | $\Delta R^2$     |
|-------------------------|-------|------|---------|--------------------|-----------------|------------------|
| Block 1                 |       |      |         |                    |                 | .35 <sup>b</sup> |
| Age                     | -.21  | .07  | -.23    | -2.84 <sup>b</sup> | [-.35, -.06]    |                  |
| Years of Education      | -.78  | .41  | -.15    | -1.90              | [-1.60, .03]    |                  |
| Alcohol Use             | 1.00  | .56  | .14     | 1.77               | [-.12, 2.11]    |                  |
| Drug Use                | 1.27  | .27  | .37     | 4.64 <sup>b</sup>  | [.73, 1.82]     |                  |
| Block 2:                |       |      |         |                    |                 | .07 <sup>b</sup> |
| Maltreatment Severity   | .06   | .04  | .11     | 1.50               | [-.02, .13]     |                  |
| <i>k</i> values         | -.08  | .97  | -.01    | -.08               | [-2.01, 1.85]   |                  |
| <i>h</i> values         | -6.40 | 1.81 | -.26    | -3.53 <sup>b</sup> | [-10.00, -2.81] |                  |

Note. N = 123 for all variables. Final  $R^2 = .416$ .<sup>a</sup>  $p < .05$ . <sup>b</sup>  $p < .01$ 

A third sequential multiple regression was used to test hypothesis 1c that maltreatment severity, *k* values, and *h* values would predict variability in proactive criminal thinking above and beyond the contribution of age, years of education, alcohol use severity, and drug use severity. No cases had missing data, and there were no violations of regression assumptions. Table 11 displays the unstandardized regression coefficients (B), their standard error (SE), the standardized coefficients ( $\beta$ ), the 95% confidence interval for the unstandardized coefficients, and the change in  $R^2$  at each block of the model. For this model,  $R^2$  was found to be .352 and significantly different from 0 in each block, which indicated 35.2% of variability in reactive criminal thinking could be explained by the combination of the predictors. Also, the change in  $R^2$  from block 1 to block 2 was significant,  $F(4, 118) = 13.04, p < .001$ ;  $F(7, 115) = 8.93, p < .001$ ,

supporting hypothesis 1c that maltreatment severity,  $k$  values, and  $h$  values predict variability in proactive criminal thinking beyond what is predicted by age, years of education, alcohol use severity, and drug use severity. In particular, about 5% of the total variability in reactive criminal thinking can be explained by maltreatment severity,  $k$  values, and  $h$  values. An examination of the regression coefficients indicated that while controlling for age, years of education, and drug use severity,  $h$  values significantly contributed to the overall model. When controlling for other explanatory variables, lower  $h$  values (i.e., steeper discounting) led to higher proactive criminal thinking scores.

Table 11

*Hierarchical Multiple Regression Analysis Predicting Proactive Criminal Thinking.*

| Order of Entry/Variable | B    | SE   | $\beta$ | $t$                | 95% CI for B | $\Delta R^2$     |
|-------------------------|------|------|---------|--------------------|--------------|------------------|
| Block 1                 |      |      |         |                    |              | .31 <sup>b</sup> |
| Age                     | -.02 | .01  | -.29    | -3.54 <sup>a</sup> | [-.03, -.01] |                  |
| Years of Education      | -.04 | .03  | -.12    | -1.45              | [-.10, .02]  |                  |
| Alcohol Use             | .02  | .04  | .04     | .48                | [-.06, .09]  |                  |
| Drug Use                | .08  | .02  | .34     | 4.09 <sup>b</sup>  | [.04, .11]   |                  |
| Block 2                 |      |      |         |                    |              | .05 <sup>a</sup> |
| Maltreatment Severity   | .003 | .003 | .10     | 1.24               | [-.002, .01] |                  |
| $k$ values              | -.01 | .07  | -.01    | -.15               | [-.14, .12]  |                  |
| $h$ values              | -.33 | .12  | -.21    | 2.69 <sup>a</sup>  | [-.58, -.09] |                  |

Note.  $N = 123$  for all variables. Final  $R^2 = .352$ .

<sup>a</sup>  $p < .05$ . <sup>b</sup>  $p < .01$

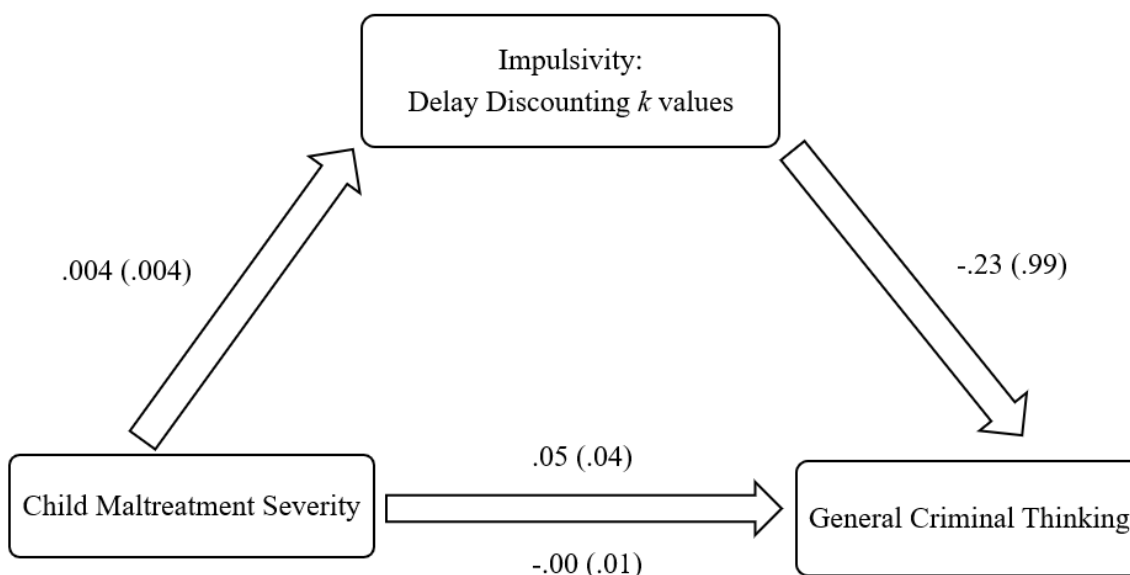
## Mediation: Hypothesis 2

To examine hypothesis 2, which tested whether delay discounting for monetary outcomes mediated the relationship between childhood maltreatment and general criminal thinking after controlling for age, years of education, and drug use a mediation model was conducted (see Figure 5). In addition to the hypothesis, two additional mediation models were also conducted to test if mediation occurred with either reactive or proactive criminal thinking patterns. All mediation models were conducted through the process macro in SPSS (Preacher & Hayes, 2004). In each of the mediation models, age, years of education, and drug use severity were entered as covariates to control for the significant relationship presented in the regression model.

In Step 1 (c path) of the mediation model, the regression of child maltreatment severity on general criminal thinking while controlling for age, years of education, and drug severity, without the mediator, was not significant,  $B = .05$ ,  $SE = .04$ ,  $t(118) = 1.24$ ,  $p > .05$ . Step 2 (a path) showed the regression of child maltreatment severity on the mediator,  $k$  values, was not significant,  $B = .004$ ,  $SE = .004$ ,  $t(118) = 1.01$ ,  $p > .05$ . Step 3 (b path) of the mediation process showed that the mediator ( $k$  values) controlling for child maltreatment severity was not significant,  $B = -.23$ ,  $SE = .99$ ,  $t(117) = -.23$ ,  $p > .05$ . Step 4 (c') of the analyses revealed that controlling for the mediator ( $k$  values), child maltreatment severity was not a significant predictor of general criminal thinking,  $B = .05$ ,  $SE = .04$ ,  $t(117) = 1.25$ ,  $p > .05$ . The bootstrapping method indicated the indirect effect,  $B = -.00$ ,  $SE = .01$ , 95% CI  $[-.01, .01]$  was not statistically significant because a zero was included in the 95% CI, and mediation did not occur (Preacher & Hayes, 2004). A Sobel test also concluded there was no mediation.

Figure 5

*Hypothesis 2 Mediation Model: Impulsivity did not mediate the relationship between Child Maltreatment Severity and General Criminal Thinking.*



Two additional analyses were conducted to test whether delay discounting for monetary outcomes mediated the relationship between childhood maltreatment and reactive criminal thinking, and the second included proactive criminal thinking. Both analyses controlled for age, years of education, and drug use. Mediation did not occur in either additional model. Table 12 displays the three models with discounting  $k$  values as the nonsignificant mediator, and the relationship between child maltreatment and criminal thinking patterns while controlling for age, years of education, and drug use severity.

Table 12

*Delay discounting  $k$  values as a nonsignificant mediator between child maltreatment and criminal thinking patterns while controlling for age, years of education, and drug use severity.*

| Criminal Thinking Style | Effect of maltreatment on $k$ values |      | Effect of $k$ values on criminal thinking controlling for maltreatment |      | Direct Effect of maltreatment on criminal thinking |     | Indirect effect of maltreatment on criminal thinking through $k$ values |     | 95% CI for Indirect Effect |
|-------------------------|--------------------------------------|------|------------------------------------------------------------------------|------|----------------------------------------------------|-----|-------------------------------------------------------------------------|-----|----------------------------|
|                         | B                                    | SE   | B                                                                      | SE   | B                                                  | SE  | B                                                                       | SE  |                            |
| General                 | .004                                 | .004 | -.23                                                                   | .99  | .05                                                | .04 | -.00                                                                    | .01 | [-.01, .01]                |
| Reactive                | .004                                 | .004 | -.11                                                                   | 1.05 | .05                                                | .04 | -.00                                                                    | .01 | [-.01, .01]                |
| Proactive               | .004                                 | .004 | -.16                                                                   | 1.05 | .04                                                | .04 | -.00                                                                    | .01 | [-.01, .01]                |

Note: B: unstandardized coefficient, SE: standard error.

### Mediation: Hypothesis 3

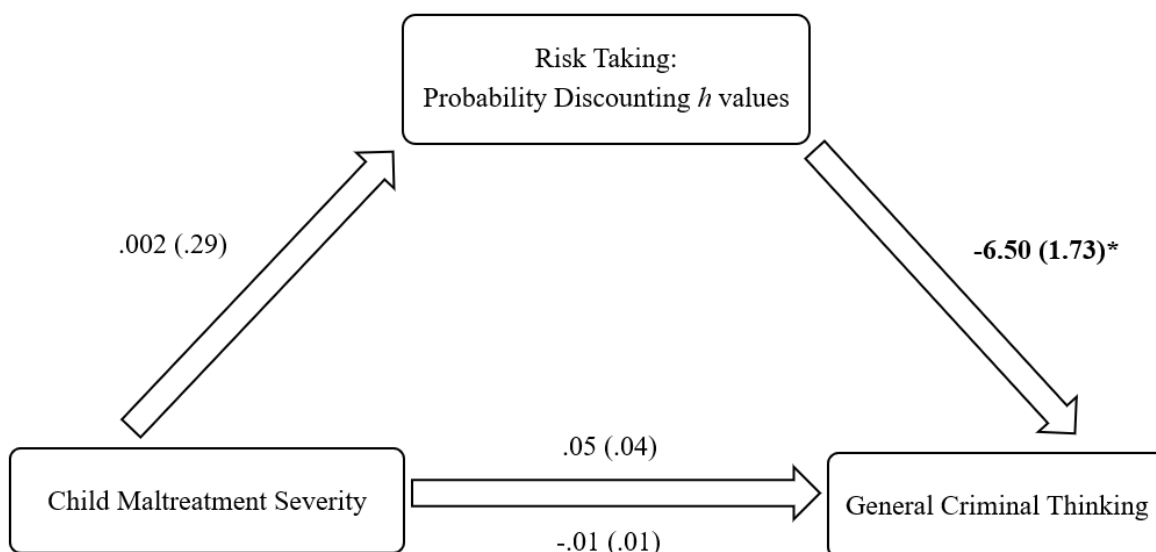
To examine hypothesis 3, which tested if probability discounting for monetary outcomes mediated the relationship between childhood maltreatment and general criminal thinking after controlling for age, years of education, and substance use, a mediation model was conducted (see Figure 6). Two additional mediation models were conducted to test if mediation occurred with either reactive or proactive criminal thinking patterns. All mediation models were conducted through the process macro in SPSS (Preacher & Hayes, 2004). In each of the mediation models, age, years of education, and drug use severity were entered as covariates to control for the significant relationship presented in the regression model.

In Step 1 (c path) of the mediation model, the regression of child maltreatment severity on general criminal thinking while controlling for age, years of education, and drug severity, without the mediator ( $h$  values), was not significant,  $B = .05$ ,  $SE = .04$ ,  $t(118) = 1.24$ ,  $p > .05$ .

Step 2 (a path) showed the regression of child maltreatment severity on the mediator,  $h$  values, was not significant,  $B = .002$ ,  $SE = .29$ ,  $t(118) = -1.07$ ,  $p > .05$ . Step 3 (b path) of the mediation process showed the mediator ( $h$  values) was significant while controlling for child maltreatment severity, age, years of education, and drug use severity,  $B = -6.50$ ,  $SE = 1.73$ ,  $t(117) = -3.76$ ,  $p < .001$ . Step 4 (c') of the analyses revealed that controlling for the mediator ( $h$  values), child maltreatment severity was not a significant predictor of general criminal thinking,  $B = .06$ ,  $SE = .04$ ,  $t(117) = 1.67$ ,  $p > .05$ . The bootstrapping method indicated the indirect effect,  $B = -.01$ ,  $SE = .01$ , 95% CI  $[-.04, .01]$  was not statistically significant because a zero was included in the 95% CI, and mediation did not occur (Preacher & Hayes, 2004). A Sobel test also concluded there was no mediation.

Figure 6

*Hypothesis 3 Mediation Model: Risk-taking did not mediate the relationship between Child Maltreatment Severity and General Criminal Thinking.*



Note. \* indicates significance at  $p < .05$ .

Two additional analyses were conducted to test whether probability discounting for monetary outcomes mediated the relationship between childhood maltreatment and reactive criminal thinking, and the second included proactive criminal thinking. Both analyses controlled for age, years of education, and drug use. Within each of these models, the  $b$  path showed that the mediator ( $h$  values) was significantly related to both reactive and proactive criminal thinking while controlling for child maltreatment severity, age, years of education, and drug use severity. However, mediation did not occur in either additional model. Table 13 displays the three models with probability discounting  $h$  values as the nonsignificant mediator, and the relationship between child maltreatment and criminal thinking patterns while controlling for age, years of education, and drug use severity.

Table 13

*Probability discounting  $h$  values as a nonsignificant mediator between child maltreatment and criminal thinking patterns while controlling for age, years of education, and drug use severity.*

| Criminal Thinking Style | Effect of maltreatment on $h$ values |     | Effect of $h$ values on criminal thinking controlling for maltreatment |      | Direct Effect of maltreatment on criminal thinking |     | Indirect effect of maltreatment on criminal thinking through $h$ values |     | 95% CI for Indirect Effect |
|-------------------------|--------------------------------------|-----|------------------------------------------------------------------------|------|----------------------------------------------------|-----|-------------------------------------------------------------------------|-----|----------------------------|
|                         | B                                    | SE  | B                                                                      | SE   | B                                                  | SE  | B                                                                       | SE  |                            |
| General                 | .002                                 | .29 | -6.50*                                                                 | 1.73 | .05                                                | .04 | -.01                                                                    | .01 | [-.04, .01]                |
| Reactive                | .002                                 | .00 | -6.90*                                                                 | 1.83 | .05                                                | .04 | -.01                                                                    | .01 | [-.05, .01]                |
| Proactive               | .002                                 | .00 | -4.93**                                                                | 1.88 | .04                                                | .04 | -.01                                                                    | .01 | [-.03, .01]                |

Note: B: unstandardized coefficient, SE: standard error. \*coefficients are statistically significant at  $p < .01$ . \*\* coefficients are significant at  $p = .01$ .



## Discussion

This study explored the relationships among childhood maltreatment, temporal and probability discounting for monetary choices, and criminal thinking. The present study adds to the literature by including delay and probability discounting paradigms to predict criminal thinking, as well as exploring potential mediating mechanisms that explain the relationship between childhood maltreatment and criminal thinking. Based on the existing literature, it was expected that childhood maltreatment, delay discounting, and probability discounting would predict criminal thinking. It also was anticipated participants with increased maltreatment severity and steeper discounting on both paradigms would have increased general, reactive, and proactive criminal thinking patterns.

Consistent with previous literature, age, education, and drug use were all significantly related to general, reactive, and proactive criminal thinking patterns (Cuadra et al., 2013; Morgan, Fisher, Duan, Mandracchia, Murray; Walters, 2002; Whited et al., 2017). Contrary to previous research, alcohol use was not related to delay or probability discounting rates (Bjork, Hommer, Grant, & Danube, 2004; Dom, D'haene, Hulstijn, & Sabbe, 2006; MacKillop et al., 2011; Wilhelm & Mitchell, 2008). Also contrary to previous studies (Bickel, 2001; Kirby et al., 1999; Konecky & Lawyer, 2015; Mejía-Cruz, Green, Myerson, Morales-Chainé, & Nieto, 2016; Petry, 2002), overall drug use was not related to delay discounting. Overall drug use was related to probability discounting, which has only been examined in a few studies and the results have been inconsistent among the probability discounting literature (Mejía-Cruz et al., 2016). When overall drug use was broken down into individual drug use types, opioid use was the only drug that significantly related to discounting, specifically delay discounting. Thus, increased opioid use was related to steeper, more impulsive, discounting patterns, similar to previous findings

(Kirby & Petry, 2004; Kirby et al., 1999; Giordano, Bickel, Loewenstein, Jacobs, Marsch, & Badger, 2002; Madden, Petry, Badger, & Bickel, 1997; Stoltman, Woodcock, Lister, Lundahl, & Greenwald, 2015). More specifically, increased opioid use was significantly related to higher  $k$  values in the large and small magnitudes, but were not related to the medium magnitude. With regard to probability discounting, increased alcohol use was related to steeper probability discounting in only the large magnitude, whereas increased tobacco use was associated with steeper  $h$  values in the small magnitude.

Overall, the results suggest substance use is related to decision-making. In this sample, opioid use is more closely related to impulsivity than other substances identified. However, due to the small sample size, it is difficult to draw conclusive conclusions about how the different substances affect decision-making, but it appears that in this sample of incarcerated men that opioid use was prevalent and related to steeper discounting. What remains unclear from this study is when substance use begins to impact decision-making, and by how much, or if decision-making impacts substance use. These mixed results also suggest substance use alone may not explain decision-making patterns or criminal activity, nor if or how decision-making patterns influences substance use.

Although a majority of behavioral discounting research has found relationships between substance use and incarcerated individuals, Haddy and colleagues (2017) found behavioral delay discounting measures alone did not predict substance use, whereas self-report measures of impulsivity better explained the relationship. One explanation for the findings includes that self-report measures of impulsivity may capture a process of decision-making that relates to the emotional, impulsive use of substances, that behavioral measures for monetary rewards do not

capture. Indeed, Reynolds and colleagues (2006) postulated behavioral and self-report measures of impulsivity may capture different aspects of the impulsivity construct.

### **Childhood Maltreatment and Criminal Thinking**

Contrary to hypotheses, neither the number of maltreatment types nor the severity of childhood maltreatment was related to general, reactive, or proactive criminal thinking patterns. The majority (77.6%) of participants in this sample of men incarcerated in jail reported five or more types of abuse. Individuals with four or more types of childhood maltreatment trended towards increased criminal thinking, which provides information that a more powerful (larger sample) study may have found significant results similar to previous studies (Felitti et al., 1998). Compared to the original sample of data collected on males from the MAES (Teicher & Parigger, 2015), this sample of incarcerated men had significantly higher rates of maltreatment in each of the ten types of childhood maltreatment that were measured (see Figure 2). The increased amount of maltreatment experiences is consistent with reports of childhood maltreatment being overrepresented within incarcerated samples (Levenson & Grady, 2016; Reavis et al., 2013; Roos et al., 2016; Rossegger et al., 2009).

The MAES not only takes into the types of maltreatment and the amount, but also severity of each type. Although a majority of participants reported several types of maltreatment, the mean severity score ( $M = 34$ ) was low compared to the severity cutoff (51; 24% of the sample). The low severity score may indicate participants reported experiencing many types of maltreatment, but did not experience the different types of maltreatment in several ways, which is how the severity score increases. In addition, childhood maltreatment severity did not predict criminal thinking patterns while controlling for age, years of education, and substance use severity. Taken together, these data suggest childhood maltreatment was not predictive of

criminal thinking. However, analyses of criminal thought processes among this sample of incarcerated men in jail showed that a majority of the participants (73.2%) had elevated levels of criminal thinking, indicating a criminal lifestyle. Therefore, criminal thinking and subsequent criminal behavior in this sample of men in jail were not influenced by the number of types of maltreatment or maltreatment severity.

The results from the current study differ from Cuadra and colleagues (2014) study that examined recently adjudicated men from a state correctional facility and found a significant relationship between childhood maltreatment and criminal thinking. Their study utilized the CTQ (Bernstein & Fink, 1998) and PICTS (Walters, 1995), and had moderate effect sizes between childhood maltreatment and criminal thinking (general, reactive, and proactive). The lack of similarity between our studies may be due to several factors including the sample size, severity of type of crime committed to have been incarcerated in a state correctional facility, rather than jail, or the rural jail sample in this study. Kang-Brown and Subramanian (2017) found crime rates are substantially lower in rural versus urban counties; however, the jail population in rural areas is increasing steeply, in part because of individuals awaiting trial for other authorities (e.g., 41% in Idaho; Kang-Brown & Subramanian, 2017). Differences in type of crimes individuals are arrested, or charged, for more frequently in rural areas (i.e., drug vs. violent offenses) may also add to the differences between the studies.

The lack of relationship between childhood maltreatment and criminal thinking in this study may be due to how childhood maltreatment was measured. In this study, childhood maltreatment was measured by the MAES, which was established by combining features of the ACE questionnaire and the CTQ. Whereas previous studies have used either the ACE questionnaire or the CTQ to examine relationships between maltreatment and criminal behavior

or thinking. Chao (2017) found a significant relationship between childhood maltreatment as measured by the ACE questionnaire and PICTS layperson version in sample of men in the community, albeit the effect sizes were small. The study suggested ACEs were not a significant predictor of criminal thinking in laypersons, suggesting other factors above and beyond adverse experiences are related to criminal thinking (Chao, 2017).

With regard to data analyses, the literature on childhood maltreatment and criminal behavior typically utilizes logistic regression to predict whether the person was ever incarcerated, the number of incarcerations an individual has experienced (Baglivio et al., 2015; Higgins & McCabe 2000; Roos et al., 2016), or compares victims of abuse to official arrest records (i.e., yes or no committed a crime) (Ogloff, Cutajar, Mann, & Mullen, 2012). Therefore, these are samples of men and women who have reported childhood maltreatment and have been found to be more likely to have committed a crime. Therefore, other factors beyond childhood maltreatment may be related to criminal thinking and behavior that results in increased incarceration, but is not the direct mechanism.

One possible explanation for the current findings disconnect from the extant literature is that this study did not take into account factors of resilience that may be protective after childhood maltreatment that would decrease criminal thinking. Not all individuals exposed to stressful experiences are affected negatively, with estimates of 12-22% of individuals who experience abuse as children are functioning well despite their history of maltreatment (Cicchetti & Rogosch, 2009; Jaffee et al., 2007). Resilience is defined as functioning within the range of normative development despite experiencing significant adversity (Jaffee et al., 2007) due to protective factors that influence or change how an individual may respond to an adverse experience (Afifi & MacMillan, 2011). Protective factors related to resilience may take place and

interact at three different levels, including at an individual, family, or community level.

Individual protective factors are individual characteristics that promote adaptive coping such as intelligence, personality characteristics, and self-esteem. At the family level, protective factors may include supportive relationships such as a stable caregiver or a family member who can provide supportive resources. Within one's community, peers, organizations, or nonfamily relationships and social support are recognized as protective factors (Afifi & MacMillan, 2011).

Some of the protective factors that have been identified in the literature include academic engagement, average or above-average intellectual performance, social competencies, and the presence of one positive relationship with an adult caregiver (Afifi & MacMillan, 2011; Cicchetti & Rogosch, 2009). Further, positive self-esteem, ego resiliency, and ego overcontrol are predictors of resilience in maltreated children (Cicchetti & Rogosch, 2009). Consistently, intelligence, school engagement, or commitment to school was reported as a protective factor following childhood maltreatment (Afifi & MacMillan, 2011; Jaffee et al., 2008; Windom, 2017). Following childhood maltreatment, intelligence was protective when an individual had graduated from high school and/or had an average or above average intelligence quotient (Afifi & MacMillan, 2011; Jaffee et al., 2007). Jaffee and colleagues (2007) found that when comparing children who had experienced maltreatment, intelligence distinguished differences in resilience. As such, boys with above-average intelligence were more likely to have higher resilience scores than nonresilient boys (Jaffee et al., 2007). Therefore, intelligence and higher educational attainment is indicated as an individual protective factor that is difficult to modify and is stable overtime (Jaffee et al., 2007) which may help individuals, boys in particular, cope and be resilient to maltreatment long-term leading to adequate functioning despite a history of maltreatment.

Findings suggest individual characteristics and one's environment may interact and promote resilience (Windom, 2017). Notably, individual protective factors may not be associated with resilience under all conditions. However, intelligence and educational attainment measured in the current sample help explain the disconnect between childhood maltreatment and other findings. Within the current sample, educational attainment at or above a high school degree was 83.2%, which is approximately 19% higher than a large national sample of state incarcerated prisoners (Ewert & Wildhagen, 2011). Further, the mean of the brief verbal intelligence score for this sample was within the average range ( $M = 99.36$ ,  $SD = 8.03$ ). Thus, it is important to keep in mind the role of protective factors, such as intelligence, as well as the interactions between the levels of protective factors that may have impacted resilience that were not measured in this study.

### **DD, PD, and Criminal Thinking**

The current findings with men incarcerated in jail expand upon findings within incarcerated samples (Arantes et al., 2013; Varghese et al., 2014) showing temporal and probability discounting rates in offenders, where discounting rate ( $k$  and  $h$ ) decreased with increasing magnitude. Overall patterns of discounting for monetary rewards by magnitude for both delay and probability discounting were as expected with smaller rewards and probabilities being discounted more steeply than larger ones (Kirby & Marakovic, 1996; Myerson, Baumann, & Green, 2014). In contrast to research conducted by Varghese and colleagues (2014), delay discounting was not associated with general, reactive, or proactive criminal thinking patterns in men incarcerated in jail. However, probability differentially predicted criminal thinking, suggesting criminal thinking is more associated with sensitivity to risky, rather than delayed, reward outcomes.

This was the first study to demonstrate a relationship between probability discounting and criminal thinking patterns, but there is a plethora of research indicating behavioral (i.e., risk-taking) or cognitive factors (i.e., underlying psychological processes) impair decision-making (Arce & Santisteban, 2006; Franken, van Strien, Nijs, & Muris, 2008). It makes sense that probability discounting is associated with a criminal lifestyle, as one has to make choices that maintains criminal behavior through high-risk behaviors for probabilistic rewards (i.e., an illegal activity). One can speculate that as individuals are likely to take greater risks on a behavioral decision-making task, that they may also apply similar decision-making strategies in other areas of life. Other environmental factors, such as maltreatment, substance use, social economic status (Haushofer & Fehr, 2014), or mental health diagnoses may also shape and add to problems in decision-making, which may impact criminal thinking and activity. For example, individuals diagnosed with attention deficit hyperactivity disorder (ADHD) who are characterized by difficulty controlling impulsive behaviors are at an increased likelihood of participating in criminal behavior (Fletcher & Wolfe, 2014).

Research shows poverty typically leads to short-sighted and risk-adverse decisions; however, this relationship is complicated by stress, which biases attention toward more immediate cues (Haushofer & Fehr, 2014). Thus, deciding to engage with salient cues in one's environment complicates the decision process further, becoming even more challenging when environmental stressors are compounded (i.e., choosing substances over having or saving money). Therefore, choices toward risk-taking and impulsive action may lead to a cycle of problematic thinking and behaviors. Depleted cognitive resources allocated to a choice, in addition to environmental factors, influence decisions-making. Depleted cognitive resources, based on the environment or other stressors, appears to alter decision-making patterns. Although



the underlying cognitive process is not clear from this study, the discounting literature continues to debate possible separate processes involved in decision making for delayed rewards compared to probabilistic rewards.

The differential in sensitivity to probabilistic versus delayed outcomes is consistent with Green and Myerson's (2004; 1996; 2013; Holt, Green, & Myerson, 2003) assertion that PD and DD represent different underlying processes rather than Rachlin and colleagues' (1991) contention that PD and DD represent different facets of the same process. Consistent with previous literature, the finding that probability discounting  $h$  values are related to general, reactive, and proactive criminal thinking compared to delay discounting  $k$  values provides evidence for separate underlying processes of impulsivity (Baumann & Odum, 2012; De Wit, 2008; Holt, Green, & Myerson, 2003; Green, & Myerson, 2004; Madden, Petry, & Johnson, 2009; Mishra & Lalumiere, 2011; Olson, Hooper, Collins, & Luciana, 2007; Shead & Hodgins, 2009; Takahashi, Takagishi, Nishinak, Makino, & Fukui, 2014). Thus, the data suggest different processes underlie the discounting of delayed and probabilistic rewards in this sample of incarcerated men. Although delay discounting was not significantly related to many of the variables in this study, it should be noted that many decisions made every day are both delayed and probabilistic (Vanderveldt, Green, & Myerson, 2015). Behavior tends to more complex than the behaviors captured separately by either delay or probability discounting. A better description of behavior may require taking a multiplicative model into account (Vanderveldt, Green, & Myerson, 2015), which may help explain consequences such as incarceration, which is both uncertain and delayed. Similarly, delay discounting procedures for specific domains, for example discounting related to offending, may better capture outcomes; however, beyond domain specificity for substance or risky-sexual behavior, discounting tasks for criminal behavior does

not exist. Thus, probability discounting may be a task that can be utilized in criminal samples to help identify criminal risk, or even show progress in changes in decision-making related to impulsivity to determine program eligibility or recidivism risk. Assessing probability discounting in relation to criminal thinking may be a tool to help promote public safety, and due to the brief nature of the assessment, can be a valuable resource within correctional settings where resources, either physical or time, are scarce.

Many of the procedures employed in the current study were similar to those that Varghese and colleagues (2014) used, except Varghese and colleagues sampled inmates in groups within five months of release from a southern state prison, whereas the current study utilized individual interviews within a jail sample. These samples were similar in age, but differed in proportion of ethnicity. The current study was primarily made up of Caucasians (65.6%) and Hispanic Americans (14.4%) and Varghese, et al. equally sampled a large proportion of Caucasians (46.6%) and African Americans (43.2%).

Although the samples differed in terms of being collected in a jail versus a state prison, criminal thinking patterns do not appear to be due to this difference. The criminal thinking patterns in the current study are similar to scores found in previous research conducted with prisoners (Walters & Lowenkamp, 2016). Varghese and colleagues (2014) did not report the criminal thinking data in their sample of inmates within five months of release from a state prison, making it difficult to report on similarities between the samples. When comparing discounting rates, it appears Varghese and colleagues mean discounting rates per magnitude were all higher than the means in the current study, suggesting individuals within five months of release from prison may be more impulsive than individuals in jail. Thus, discrepancies between discounting rates may be due to differences in ethnicity.

Although research is limited, research has shown discrepancies between discounting rates for different ethnicities. Andrade and Petry (2014) compared discounting rates of individuals with problematic gambling between Whites, African Americans, and Hispanics. The researchers found African American and Hispanic gamblers discounted delayed money more steeply, thus were more impulsive, than white gamblers. Andrade and Petry (2014) argued this was similar to findings of de Witt and colleagues (2007; as cited in Andrade & Petry, 2014, p. 2) who found that middle aged white adults discounted rewards less steeply than matched African American peers. Additionally, one study found that African American college students discounted rewards more steeply on the MCQ than European American college students (Dennhardt & Murphy, 2011) indicating ethnicity may impact impulsive decision making. However, many other factors that were not reported for comparison such as IQ, education level, or mental health concerns could also be factors that lead to discrepancies between discounting rates.

### **Predictors of Criminal Thinking**

Three separate sequential multiple regressions were conducted to examine if maltreatment severity,  $k$  values, and  $h$  values would predict variability in general, reactive, and proactive criminal thinking. Each of the regression models significantly predicted general, reactive, and criminal thinking patterns beyond what is predicted by age, years of education, alcohol use severity, and drug use severity. However, in all of the models, only age, drug use severity, and  $h$  values significantly contributed to the overall models. Therefore, lower  $h$  values (i.e., higher risk-taking) was associated with higher general, reactive, and proactive criminal thinking patterns beyond age and drug use severity. Thus, the current results only partially supported the hypothesis as probability discounting was the only significant predictor of criminal thinking.

This is the first study to show probability discounting is related to all three types of criminal thinking patterns in men incarcerated in jail, indicating that individuals who exhibit a relative preference for uncertain over certain outcomes tend to exhibit increased criminal thinking patterns. The strongest relationships were between probability discounting and general and reactive criminal thinking patterns. This suggests individuals who have a propensity for risk-taking on a behavioral measure of impulsivity may also have more risk-taking cognitive processes, and engage in more reactive, or impulsive, criminal thinking patterns which may have implications for their criminal behavior. These findings may shed light on how cognitive processes, such as probabilistic discounting, are related to the nature of recidivism.

### *Mediation Analyses*

The mediation model that tested the hypothesis that discounting would mediate associations between child maltreatment and general criminal thinking yielded no significant results. Although probability discounting predicted criminal thinking in the path model, no other paths, or indirect effects, were significant. Therefore, neither DD or PD mediated the relationship between child maltreatment and criminal thinking while controlling for age, years of education, and drug use severity.

To date, this was one of the first studies to bring childhood maltreatment, delay and probability discounting, and criminal thinking together in a cross-sectional study that gathered information from environmental conditions (i.e., childhood maltreatment), choices (i.e., behavioral decision making through discounting paradigms), and cognitions (i.e., criminal thinking). From this study, it is difficult to know for certain the bi-directional relationship between several of the variables. For example, this study collected data in a particular order, but was unable to establish the temporal relationship between childhood maltreatment, criminal

thinking, and decision making. Based on previous literature, the non-relationships between childhood maltreatment (Cuadra et al., 2014), or delay discounting (Varghese et al., 2014), with child criminal thinking were unexpected. The current study was methodologically different from the previous literature, including that the maltreatment measured used in this study was a combination of two frequently used measures, with only one of those measures (i.e., CTQ) was used in the previous study. Therefore, childhood maltreatment findings may have differed due to measurement differences.

One previous study has shown a significant relationship between scores on the MCQ and criminal thinking patterns on the PICTS (Varghese et al., 2014); however, this study was unable to demonstrate the relationship between delay discounting ( $k$  values) and general, reactive, or proactive criminal thinking using either the Ftotal or geometric means method (Kirby et al., 2009; Varghese et al., 2014).

Surprisingly, impulsivity measured by delay discounting for monetary rewards was not related to alcohol use, substance use, childhood maltreatment, or criminal thinking. Impulsivity is a construct that has been measured in many studies with substance use and is robustly related to different samples with differing measures, including both discounting paradigms and self-report (Haddy et al., 2017; Sharma, Markon, & Clark, 2014). Thus, the lack of relationships between impulsivity and other variables in the current study seems anomalous. However, Huddy and colleagues (2017) sampled 72 incarcerated men from a high security prison and found self-report measures of impulsivity predicted problematic behaviors such as substance misuse, gambling, and personality disorders better than behavioral measures (i.e., the MCQ). The authors concluded that self-report measures may reflect emotionally charged decision making in daily

life more comparable to self-report measures than neutral behavioral measures of impulsivity (Huddy et al., 2017).

An explanation for the insignificant mediation findings may be that substance use better explains the underlying mechanisms between childhood maltreatment and criminal thinking. Based on previous research, individuals with childhood maltreatment abuse substances at higher rates than those who were not abused. Additionally, individuals with a substance use disorder are steeper discounters than non-substance users (Bickel, 2001; Kirby et al., 1999; Konecky & Lawyer, 2015; Lawyer et al., 2011; MacKillop et al., 2016; Mejía-Cruz, Green, Myerson, Morales-Chainé, & Nieto, 2016; Petry, 2002). As childhood maltreatment may lead to substance use (Anda et al., 2006; Campbell et al., 2016; Dube et al., 2006; Shin, Lee, Jeon, & Wills, 2015), the use of substances may impact neural networks of impulsive decision making (Crews & Boettiger, 2009; Squeglia, Jacobus, & Tapert, 2009) and may be a better indicator of behavioral choice when examining incarcerated men, rather than hypothetical behavioral choice paradigms for money. Therefore, it is likely that within this sample of incarcerated men, substance use, rather than delay or probability discounting, mediated the relationship between childhood maltreatment and criminal thinking.

#### *Limitations and Future Directions*

The findings of the present study should be viewed in the context of the limitations of the study. One limitation of this study is the generalizability of results to similar populations due to the characteristics of this sample (male inmates in Southeastern Idaho jails). Future directions of similar research should broaden the range of diverse participants (e.g., age, ethnicity, and types of crime for which individuals were incarcerated) and examine how severity, thus the frequency

and duration, of maltreatment affects criminal thinking, as well as if substance use mediates this relationship.

A second limitation to the current findings is the nature of the measures and procedures may have made some individuals hesitant to endorse certain items. For example, individuals may have minimized their childhood maltreatment experiences, resulting in underreporting of childhood maltreatment. However, previous literature has indicated the retrospective method of data collection produces reliable data (Brewin et al., 1993; Dube et al., 2004; Teicher & Parigger, 2015). Participants were also asked about the occurrence of events rather than attributions (i.e., how severely they perceived abuse) and did not ask whether individuals believed they were abused, but whether or not they experienced particular events. Similarly, choices individuals made may have been influenced by the researchers reading the measures to them, resulting in choices towards a “socially correct” answer that was motivated by impression management. However, to check the validity of respondents answers to the type of crime committed, official records compared to individuals’ responses and indicated 86.4% of participants responded consistently with their recorded objective charges. Similarly, only three participants had scores on the PICTS that were invalid. Thus, participants were likely responding in a truthful and open manner to the measures within the study.

Walters (2015) interpreted that discounting related to criminal thinking by Varghese and colleagues (2014) was associated with emotions such as anger, frustration, urgency, excitement, and pleasure that interfere with one’s ability to make balanced and reasonable decisions. Further, Walters (2015) has postulated how emotions may affect criminal thinking patterns. Huddy and colleagues (2017) also indicate impulsive behavior occurs in an incarcerated sample due to “hot” and “cool” cognitions that are emotionally charged, but found self-report measures are more

emotionally charged and better predictors of problematic behaviors than behavioral measures of impulsivity. Thus, emotions may impact decision-making, through either amplifying or suppressing emotions, and changing cognitions in accord with the theory of positive and negative urgency. Cyders and Smith's (2008) theory of positive and negative urgency suggests heightened emotions (either positive or negative) lead to poor outcomes in decision-making due to utilizing less rational information. Thus, future research should examine how childhood maltreatment, substance use, and emotion regulation affect impulsivity and criminal thinking patterns.

Within this sample of men in jail, parental verbal abuse (i.e., swore at them or called them names, said hurtful things, threatened to leave or abandon them) was the only type of childhood maltreatment that was significantly related to criminal thinking. Research shows early adverse experiences such as verbal abuse are associated with functional and structural changes in the brain that impacts executive functioning, the prefrontal cortex, and amygdala, which impact emotional and cognitive functioning (Creeden, 2009; Fox et al., 2015; Roos et al., 2016; Cross, Fani, Powers, & Bradley, 2017; Levenson & Grady, 2016; Teicher et al., 2002; Tuscic, Flander, & Mateskovic, 2013). Verbal aggression, such as ridicule, disdain, and humiliation are also commonly associated with psychological symptoms such as depression and anxiety and cannot be easily counteracted by praise and warmth (Polcari, Rabi, Bolger, Teicher, 2014). Morgan and colleagues (2010) found 92% of incarcerated men and women met criteria for a severe mental illness and 66% of the sample with mental illness endorsed a criminal lifestyle (48% male). Thus, mental illness and criminal behavior co-occur and may be due to previous adverse experiences, including primarily verbal abuse in childhood. Therefore, future studies might focus on how verbal abuse by parents or caregivers may be an underlying mechanism between psychiatric symptoms and impulsive behavior or criminal thinking.



### *Implications and Practical Directions*

Despite the limitations of this study, research focusing on child maltreatment, discounting paradigms, and criminal thinking has the potential to identify underlying cognitive processes in offenders. This was one of the first studies to show that a preference for probabilistic monetary rewards was predictive of criminal thinking patterns while controlling for age, years of education, and drug use. Thus, probability discounting and underlying behavioral processes that influence self-regulatory decisions predicted criminal cognitions. Understanding factors that predict criminal thinking in offenders has implications in developing interventions targeted on underlying behaviors and cognitive processes that can better serve this population and help reduce recidivism.

Based on the high levels of childhood maltreatment in this study, specifically rural jails, would be well served by taking a trauma-informed approach to correctional care (Miller & Najavits, 2012). Although trauma-informed care is beginning to be implemented into institutional systems, it cannot be overstated how important this approach is to correctional care. Trauma-informed correctional care includes training all staff to be aware of the impact of trauma, and tries to minimize retraumatization by being sensitive to how institutions may inadvertently reenact traumatic dynamics. For rural populations in particular, taking a trauma-informed approach may be difficult due to a lack of funding or resources. Rural counties often struggle to provide services, such as education, health care, or substance abuse treatment (Kang-Brown & Subramanian, 2017). Education for all staff about a trauma-informed approach is important for security purposes as this can control or reduce healthcare costs (including mental health housing), control or reduce staff turnover, reduce the use of seclusion and restraints through de-escalating critical incidents, and overall, effectively manage behavior while making

the environment safer for inmates and staff. Even if institutions do not choose, or are unable, to offer trauma-specific clinical interventions available to inmates, the principles applied by staff can still be helpful (Miller & Najavits, 2012)

Within the current sample, approximately half of the offenders were incarcerated for substance use, and even more struggled with substance use that may have contributed to their offending. Rehabilitation programs, or diversion, is a widely accepted method in the criminal justice system, especially for low risk or mentally ill offenders, but many small jurisdictions lack the means or support for formal diversion programs, thus jails becoming an appropriate placement resulting in overcrowding. Overcrowding causes its own potential risk problems, making it inappropriate for a vast majority of offenders to remain incarcerated based on their low risk of harm to others. Likely, jails with limited resources do not have a risk assessment tool, or staff trained to administer these tools, making it difficult to quickly assess, identify, and refer low level offenders for a more appropriate placement, for example, an inpatient substance abuse treatment (Kang-Brown & Subramanian, 2017).

Above and beyond a trauma-informed approach and effects of substance use, it appears cognitive processes related to risk-taking are predictive of criminal thinking patterns that endorse a criminal lifestyle. Thus, risk appears to not only be a target of assessment (i.e., risk level), but also a target for intervention (i.e., reducing risk-taking decision-making) in incarcerated samples. Research on other problematic social behaviors regarding risk-taking and probability discounting have found mindfulness-based interventions have reduced probability discounting (de Lisle, Dowling, & Allen, 2012; Marcowski, Białaszek, Dudek, & Ostaszewski, 2017) although some research supports domain specificity (or discounting for food versus money) for the mindfulness intervention (Hendrickson & Rasmussen, 2013). Within incarcerated samples, Mindfulness or

meditation practices have both been found to be helpful in reducing substance use problems, psychiatric problems, and post-release risky behavior (Bowen et al., 2006; Malouf, Youman, Stuewig, Witt, & Tangney, 2017; Miller & Najavits, 2012). Thus, it appears that present-focused treatments that focus on uncertainty (a component of risk-taking), cognitions and decision-making maintaining risk-taking, and interventions tolerating uncomfortableness show promise in reducing risk as well as increasing prosocial behaviors and post-risk release. Well supported interventions utilizing mindfulness and are well-supported by research include Cognitive-Behavior Interventions (CBI), Dialectical Behavior Therapy (DBT), and Acceptance and Commitment Therapy (ACT). These treatments have support for, and were designed to challenge belief systems, increase coping skills, reduce risk-taking, and identify and tolerate difficult emotions (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Linehan, Schmidt III, Dimeff, Craft, Kanter & Comtois, 1999; Miller & Najavits, 2012; Wolff, Huening, Shi, Frueh, Hoover, & McHugo, 2015).

As discussed previously, some inmates may have difficulty benefiting from the most effective evidence-based treatments (e.g., cognitive-behavioral therapy) if the impact of childhood trauma is not addressed (Miller & Najavits, 2012). Other inmates may benefit more from manualized, present-focused, treatment approaches that incorporate strong educational components providing coping skills (i.e., Seeking Safety; Wolff et al., 2015) or treatments targeting emotion regulation, self-control, and emotions related to offense specific behavior (i.e., shame and guilt), without focusing on childhood maltreatment (Malouf et al., 2017). Importantly for jails are brief interventions. Bowen and colleagues (2006) found that inmates who participated in a 10-day Vipassana meditation (VM) program had decreased in alcohol-related problems, reductions in psychiatric symptoms, and increases in positive psychosocial outcomes,

which suggested a brief alternative to existing programs such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) approaches.

More recently, a pilot randomized clinical trial (RCT) utilizing a values and mindfulness-based intervention, Re-Entry Values and Mindfulness Program (REVAMP), in a sample of male jail inmates found reduced post-release risky behavior (Malouf et al., 2017) during a brief-intervention. REVAMP targeted dimensions of mindfulness (e.g., willingness/acceptance) and associated mechanisms of action (emotion regulation, self-control, shame/ guilt) delivered twice a week for 90-minutes for four weeks. Interestingly, the researchers found willingness and acceptance, increased through mindfulness skills, allowed inmates to make the most of negative emotions, such as shame and guilt. Willingness reduced experiential avoidance, externalization of blame, and denial and provided inmates with a more constructive way of resolving the negative emotions through tolerating difficult emotions and self-judgment. Therefore, it appears brief interventions focusing on increasing mindfulness in inmates in jail is a possible intervention to target not only risk, but also symptomology that pertains to risk, such as inability to tolerate uncertainty and substance use. These interventions also appear to have additive effects of decreasing psychiatric symptoms and increasing prosocial behaviors, which can have an overall positive effect on jail operations and security. Overall, jails may want to consider incorporating brief evidence-based mindfulness interventions as programming for their inmates to help target risk-taking and reduce recidivism. The brief nature of these interventions is necessary due to the typical time inmates are incarcerated in jail. Additionally, brief interventions as outlined above also provide inmates with evidence-based options for treatment of underlying cognitive processes that target problematic behavior, differing from traditional substance-use programs (AA/NA) and improve more than one area of functioning.

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## Appendix A: Demographics Questionnaire

**Is the participant proficient in English? Yes / No (If no, please stop interview)**

1. Age? \_\_\_\_\_

2. Which option below best describes your sexual orientation?

\_\_\_ Straight/heterosexual      \_\_\_ Bisexual      \_\_\_ Other: \_\_\_\_\_

\_\_\_ Gay      \_\_\_ Questioning

3. What is your ethnic background (check all that apply)?

\_\_\_ White/European American      \_\_\_ Latino/a/x/Hispanic      \_\_\_ Other: \_\_\_\_\_

\_\_\_ American Indian      \_\_\_ Black/African American      \_\_\_\_\_

\_\_\_ Asian/Asian American/Pacific Islander      \_\_\_ Multiracial

4. Please indicate your marital status (prior to this incarceration):

\_\_\_ Single, never married      \_\_\_ Unmarried, living with partner      \_\_\_ Other

\_\_\_ Married      \_\_\_ Separated

\_\_\_ Divorced      \_\_\_ Widowed

\_\_\_ Unmarried, in committed long-distance relationship

5. What is the highest grade level you achieved? (If GED obtained, please write 'GED' next to the grade level completed)

\_\_\_ 5<sup>th</sup> grade/below      \_\_\_ 6<sup>th</sup> grade      \_\_\_ 7<sup>th</sup> grade

\_\_\_ 8<sup>th</sup> grade      \_\_\_ 9<sup>th</sup> grade      \_\_\_ 10<sup>th</sup> grade

\_\_\_ 11<sup>th</sup> grade      \_\_\_ 12<sup>th</sup> grade (did not finish)      \_\_\_ High School

Diploma

\_\_\_ Some college (no degree)      \_\_\_ Associates degree (2-year degree)      \_\_\_ Bachelor's degree (4-year degree)

\_\_\_ Master's degree      \_\_\_ Doctorate/Professional degree

6. What was your most recent employment status prior to this incarceration?

\_\_\_ Never employed      \_\_\_ Unemployed      \_\_\_ Part-time      \_\_\_ Full-time (40+ hrs/wk)

7. What is your current charge(s) for which you are currently incarcerated (Do not include probation violations)?

\_\_\_\_\_  
\_\_\_\_\_

8. What was the behavior(s) (what did you do: briefly) for which you are incarcerated (Do not include probation violations)?

\_\_\_\_\_  
\_\_\_\_\_

9. How many times have you previously been incarcerated as an adult (i.e., in jail or prison)?

\_\_\_\_\_

## Appendix B: North American Adult Reading Test (NAART)

|          |                |
|----------|----------------|
| DEBT     | SUBPOENA       |
| DEBRIS   | PLACEBO        |
| AISLE    | PROCREATE      |
| REIGN    | PSALM          |
| DEPOT    | BANAL          |
| SIMILE   | RAREFY         |
| LINGERIE | GIST           |
| RECIPE   | CORPS          |
| GOUGE    | HORS D' OEUVRE |
| HEIR     | SIEVE          |
| SUBTLE   | HIATUS         |
| CATACOMB | GAUCHE         |
| BOUQUET  | ZEALOT         |
| GAUGE    | PARADIGM       |
| COLONEL  | FACADE         |



CELLIST

LEVIATHAN

INDICT

PRELATE

DÉTENTE

QUADRUPED

IMPUGN

SIDEREAL

CAPON

ABSTEMIOUS

RADIX

BEATIFY

AEON

GAOLED

EPITOME

DEMESNE

EQUIVOCAL

SYNCOPE

REIFY

ENNUI

INDICES

DRACHM

ASSIGNATE

CIDEVANT

TOPIARY

EPERGNE

CAVEAT

VIVACE

SUPERFLUOUS

TALIPES

SYNECDOCHE

## Appendix C: Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

## A. WHO - ASSIST V3.0

|                |                      |         |                      |                      |                      |
|----------------|----------------------|---------|----------------------|----------------------|----------------------|
| INTERVIEWER ID | <input type="text"/> | COUNTRY | <input type="text"/> | CLINIC               | <input type="text"/> |
| PATIENT ID     | <input type="text"/> | DATE    | <input type="text"/> | <input type="text"/> | <input type="text"/> |

**INTRODUCTION (Please read to patient)**

Thank you for agreeing to take part in this brief interview about alcohol, tobacco products and other drugs. I am going to ask you some questions about your experience of using these substances across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills (show drug card).

Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For this interview, we will not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please let me know. While we are also interested in knowing about your use of various illicit drugs, please be assured that information on such use will be treated as strictly confidential.

**NOTE: BEFORE ASKING QUESTIONS, GIVE ASSIST RESPONSE CARD TO PATIENT**

**Question 1**

(If completing follow-up please cross check the patient's answers with the answers given for Q1 at baseline. Any differences on this question should be queried)

| In your life, which of the following substances have you <u>ever used</u> ? (NON-MEDICAL USE ONLY) | No | Yes |
|----------------------------------------------------------------------------------------------------|----|-----|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                    | 0  | 3   |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                 | 0  | 3   |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                    | 0  | 3   |
| d. Cocaine (coke, crack, etc.)                                                                     | 0  | 3   |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                  | 0  | 3   |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                          | 0  | 3   |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                   | 0  | 3   |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                      | 0  | 3   |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                            | 0  | 3   |
| j. Other - specify:                                                                                | 0  | 3   |

Probe if all answers are negative:  
\*Not even when you were in school?\*

If "No" to all items, stop interview.

If "Yes" to any of these items, ask Question 2 for each substance ever used.

## Question 2

| In the <u>past three months</u> , how often have you used the substances you mentioned ( <i>FIRST DRUG, SECOND DRUG, ETC?</i> ) | Never | Once or Twice | Monthly | Weekly | Daily or Almost Daily |
|---------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------|--------|-----------------------|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                                                 | 0     | 2             | 3       | 4      | 6                     |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                                              | 0     | 2             | 3       | 4      | 6                     |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                                                 | 0     | 2             | 3       | 4      | 6                     |
| d. Cocaine (coke, crack, etc.)                                                                                                  | 0     | 2             | 3       | 4      | 6                     |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                                               | 0     | 2             | 3       | 4      | 6                     |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                                       | 0     | 2             | 3       | 4      | 6                     |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                                                | 0     | 2             | 3       | 4      | 6                     |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                                   | 0     | 2             | 3       | 4      | 6                     |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                                         | 0     | 2             | 3       | 4      | 6                     |
| j. Other - specify:                                                                                                             | 0     | 2             | 3       | 4      | 6                     |

If "Never" to all items in Question 2, skip to Question 6.

If any substances in Question 2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.

## Question 3

| During the <u>past three months</u> , how often have you had a strong desire or urge to use ( <i>FIRST DRUG, SECOND DRUG, ETC?</i> ) | Never | Once or Twice | Monthly | Weekly | Daily or Almost Daily |
|--------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------|--------|-----------------------|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                                                      | 0     | 3             | 4       | 5      | 6                     |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                                                   | 0     | 3             | 4       | 5      | 6                     |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                                                      | 0     | 3             | 4       | 5      | 6                     |
| d. Cocaine (coke, crack, etc.)                                                                                                       | 0     | 3             | 4       | 5      | 6                     |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                                                    | 0     | 3             | 4       | 5      | 6                     |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                                            | 0     | 3             | 4       | 5      | 6                     |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                                                     | 0     | 3             | 4       | 5      | 6                     |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                                        | 0     | 3             | 4       | 5      | 6                     |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                                              | 0     | 3             | 4       | 5      | 6                     |
| j. Other - specify:                                                                                                                  | 0     | 3             | 4       | 5      | 6                     |

## Question 4

| During the <u>past three months</u> , how often has your use of <i>(FIRST DRUG, SECOND DRUG, ETC)</i> led to health, social, legal or financial problems? | Never | Once or Twice | Monthly | Weekly | Daily or Almost Daily |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------|--------|-----------------------|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                                                                           | 0     | 4             | 5       | 6      | 7                     |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                                                                        | 0     | 4             | 5       | 6      | 7                     |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                                                                           | 0     | 4             | 5       | 6      | 7                     |
| d. Cocaine (coke, crack, etc.)                                                                                                                            | 0     | 4             | 5       | 6      | 7                     |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                                                                         | 0     | 4             | 5       | 6      | 7                     |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                                                                 | 0     | 4             | 5       | 6      | 7                     |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                                                                          | 0     | 4             | 5       | 6      | 7                     |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                                                             | 0     | 4             | 5       | 6      | 7                     |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                                                                   | 0     | 4             | 5       | 6      | 7                     |
| j. Other - specify:                                                                                                                                       | 0     | 4             | 5       | 6      | 7                     |

## Question 5

| During the <u>past three months</u> , how often have you failed to do what was normally expected of you because of your use of <i>(FIRST DRUG, SECOND DRUG, ETC)?</i> | Never | Once or Twice | Monthly | Weekly | Daily or Almost Daily |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------|--------|-----------------------|
| a. Tobacco products                                                                                                                                                   |       |               |         |        |                       |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                                                                                    | 0     | 5             | 6       | 7      | 8                     |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                                                                                       | 0     | 5             | 6       | 7      | 8                     |
| d. Cocaine (coke, crack, etc.)                                                                                                                                        | 0     | 5             | 6       | 7      | 8                     |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                                                                                     | 0     | 5             | 6       | 7      | 8                     |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                                                                             | 0     | 5             | 6       | 7      | 8                     |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                                                                                      | 0     | 5             | 6       | 7      | 8                     |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                                                                         | 0     | 5             | 6       | 7      | 8                     |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                                                                               | 0     | 5             | 6       | 7      | 8                     |
| j. Other - specify:                                                                                                                                                   | 0     | 5             | 6       | 7      | 8                     |

*Ask Questions 6 & 7 for all substances ever used (i.e. those endorsed in Question 1)*

**Question 6**

| Has a friend or relative or anyone else <u>ever</u> expressed concern about your use of<br>(FIRST DRUG, SECOND DRUG, ETC.)? | No, Never | Yes, in the past 3 months | Yes, but not in the past 3 months |
|-----------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------------------------------|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                                             | 0         | 6                         | 3                                 |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                                          | 0         | 6                         | 3                                 |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                                             | 0         | 6                         | 3                                 |
| d. Cocaine (coke, crack, etc.)                                                                                              | 0         | 6                         | 3                                 |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                                           | 0         | 6                         | 3                                 |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                                   | 0         | 6                         | 3                                 |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                                            | 0         | 6                         | 3                                 |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                               | 0         | 6                         | 3                                 |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                                     | 0         | 6                         | 3                                 |
| j. Other – specify:                                                                                                         | 0         | 6                         | 3                                 |

**Question 7**

| Have you <u>ever</u> tried and failed to control, cut down or stop using<br>(FIRST DRUG, SECOND DRUG, ETC.)? | No, Never | Yes, in the past 3 months | Yes, but not in the past 3 months |
|--------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------------------------------|
| a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)                                              | 0         | 6                         | 3                                 |
| b. Alcoholic beverages (beer, wine, spirits, etc.)                                                           | 0         | 6                         | 3                                 |
| c. Cannabis (marijuana, pot, grass, hash, etc.)                                                              | 0         | 6                         | 3                                 |
| d. Cocaine (coke, crack, etc.)                                                                               | 0         | 6                         | 3                                 |
| e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)                                            | 0         | 6                         | 3                                 |
| f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)                                                    | 0         | 6                         | 3                                 |
| g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)                                             | 0         | 6                         | 3                                 |
| h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)                                                | 0         | 6                         | 3                                 |
| i. Opioids (heroin, morphine, methadone, codeine, etc.)                                                      | 0         | 6                         | 3                                 |
| j. Other – specify:                                                                                          | 0         | 6                         | 3                                 |

## Appendix D: Maltreatment Abuse and Exposure Scale (MAES)

## MAES

|                                                                                                                                                                                                                                                                             |                                                                                                                             |                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Sometimes parents, stepparents or other adults living in the house do hurtful things.</b></p> <p><b>If this happened during your <u>childhood</u> (first 18 years of your life), please say ‘Yes’. If this did not happen in your childhood, please say ‘No.’</b></p> |                                                                                                                             |                                                                              |
| 1.                                                                                                                                                                                                                                                                          | Swore at you, called you names, said insulting things like your “fat”, “ugly”, “stupid”, etc. more than a few times a year. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 2.                                                                                                                                                                                                                                                                          | Said hurtful things that made you feel bad, embarrassed or humiliated more than a few times a year.                         | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 3.                                                                                                                                                                                                                                                                          | Acted in a way that made you afraid that you might be physically hurt.                                                      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 4.                                                                                                                                                                                                                                                                          | Threatened to leave or abandon you.                                                                                         | <input type="radio"/> Yes <input type="radio"/> No <sub>0</sub>              |
| 5.                                                                                                                                                                                                                                                                          | Locked you in a closet, attic, basement or garage.                                                                          | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 6.                                                                                                                                                                                                                                                                          | Intentionally pushed, grabbed, shoved, slapped, pinched, punched or kicked you.                                             | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 7.                                                                                                                                                                                                                                                                          | Hit you so hard that it left marks for more than a few minutes.                                                             | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 8.                                                                                                                                                                                                                                                                          | Hit you so hard, or intentionally harmed you in some way, that you received or should have received medical attention.      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 9.                                                                                                                                                                                                                                                                          | Spanked you on your buttocks, arms or legs.                                                                                 | <input type="radio"/> Yes <input type="radio"/> No <sub>0</sub>              |
| 10.                                                                                                                                                                                                                                                                         | Spanked you on your bare (unclothed) buttocks.                                                                              | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 11.                                                                                                                                                                                                                                                                         | Spanked you with an object such as a strap, belt, brush, paddle, rod, etc.                                                  | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 12.                                                                                                                                                                                                                                                                         | Made inappropriate sexual comments or suggestions to you.                                                                   | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 13.                                                                                                                                                                                                                                                                         | Touched or fondled your body in a sexual way.                                                                               | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 14.                                                                                                                                                                                                                                                                         | Had you touch their body in a sexual way.                                                                                   | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

**Please continue**  
**(page 1 of 4)**

|                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                      |                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Sometimes parents, stepparents or other adults living in the house do hurtful things to your <u>siblings</u> (brother, sister, stepsiblings). If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                                                                                                      |                                                                              |
| 15.                                                                                                                                                                                                                                                                                                                   | Hit your sibling (stepsibling) so hard that it left marks for more than a few minutes.                                                               | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 16.                                                                                                                                                                                                                                                                                                                   | Hit your sibling (stepsibling) so hard, or intentionally harmed him/her in some way, that he/she received or should have received medical attention. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 17.                                                                                                                                                                                                                                                                                                                   | Made inappropriate sexual comments or suggestions to your sibling (stepsibling).                                                                     | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 18.                                                                                                                                                                                                                                                                                                                   | Touched or fondled your sibling (stepsibling) in a sexual way.                                                                                       | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

|                                                                                                                                                                                                                                                                 |                                                                   |                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Sometimes adults or older individuals NOT living in the house do hurtful things to you. If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                   |                                                                              |
| 19.                                                                                                                                                                                                                                                             | Had you touch their body in a sexual way.                         | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 20.                                                                                                                                                                                                                                                             | Actually had sexual intercourse (oral, anal or vaginal) with you. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

|                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                           |                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Sometimes intense arguments or physical fights occur between parents, stepparents or other adults (boyfriends, girlfriends, grandparents) living in the household. If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                                                                                                                                           |                                                                              |
| 21.                                                                                                                                                                                                                                                                                                                                        | Saw adults living in the household push, grab, slap or throw something at your mother (stepmother, grandmother).                                                                          | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 22.                                                                                                                                                                                                                                                                                                                                        | Saw adults living in the household hit your mother (stepmother, grandmother) so hard that it left marks for more than a few minutes.                                                      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 23.                                                                                                                                                                                                                                                                                                                                        | Saw adults living in the household hit your mother (stepmother, grandmother) so hard, or intentionally harm her in some way, that she received or should have received medical attention. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 24.                                                                                                                                                                                                                                                                                                                                        | Saw adults living in the household push, grab, slap or throw something at your father (stepfather, grandfather).                                                                          | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 25.                                                                                                                                                                                                                                                                                                                                        | Saw adults living in the household hit your father (stepfather, grandfather) so hard that it left marks for more than a few minutes.                                                      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

|                                                                                                                                                                                                                                                                            |                                                                                                                             |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Sometimes children your own age or older do hurtful things like bully or harass you.</b></p> <p><b>If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                                                                             |                                                                              |
| 26.                                                                                                                                                                                                                                                                        | Swore at you, called you names, said insulting things like your "fat", "ugly", "stupid", etc. more than a few times a year. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 27.                                                                                                                                                                                                                                                                        | Said hurtful things that made you feel bad, embarrassed or humiliated more than a few times a year.                         | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 28.                                                                                                                                                                                                                                                                        | Said things behind your back, posted derogatory messages about you, or spread rumors about you.                             | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 29.                                                                                                                                                                                                                                                                        | Intentionally excluded you from activities or groups.                                                                       | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 30.                                                                                                                                                                                                                                                                        | Acted in a way that made you afraid that you might be physically hurt.                                                      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 31.                                                                                                                                                                                                                                                                        | Threatened you in order to take your money or possessions.                                                                  | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 32.                                                                                                                                                                                                                                                                        | Forced or threatened you to do things that you did not want to do.                                                          | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 33.                                                                                                                                                                                                                                                                        | Intentionally pushed, grabbed, shoved, slapped, pinched, punched, or kicked you.                                            | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 34.                                                                                                                                                                                                                                                                        | Hit you so hard that it left marks for more than a few minutes.                                                             | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 35.                                                                                                                                                                                                                                                                        | Hit you so hard, or intentionally harmed you in some way, that you received or should have received medical attention.      | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 36.                                                                                                                                                                                                                                                                        | Forced you to engage in sexual activity against your will.                                                                  | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 37.                                                                                                                                                                                                                                                                        | Forced you to do things sexually that you did not want to do.                                                               | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |



|                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                               |                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Please indicate if the following happened during your childhood (first 18 years of your life).</b><br/> <b>If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                                                                                                                                                                                               |                                                                              |
| 38.                                                                                                                                                                                                                                                                                | You felt that your mother or other important maternal figure was present in the household but emotionally unavailable to you for a variety of reasons like drugs, alcohol, workaholic, having an affair, heedlessly pursuing their own goals. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 39.                                                                                                                                                                                                                                                                                | You felt that your father or other important paternal figure was present in the household but emotionally unavailable to you for a variety of reasons like drugs, alcohol, workaholic, having an affair, heedlessly pursuing their own goals. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 40.                                                                                                                                                                                                                                                                                | A parent or other important parental figure was very difficult to please.                                                                                                                                                                     | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 41.                                                                                                                                                                                                                                                                                | A parent or other important parental figure did not have the time or interest to talk to you.                                                                                                                                                 | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 42.                                                                                                                                                                                                                                                                                | One or more individuals in your family made you feel loved.                                                                                                                                                                                   | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 43.                                                                                                                                                                                                                                                                                | One or more individuals in your family helped you feel important or special.                                                                                                                                                                  | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 44.                                                                                                                                                                                                                                                                                | One or more individuals in your family were there to take care of you and protect you.                                                                                                                                                        | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 45.                                                                                                                                                                                                                                                                                | One or more individuals in your family were there to take you to the doctor or Emergency Room if the need ever arose, or would have if needed.                                                                                                | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

|                                                                                                                                                                                                                                                                                            |                                                                   |                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p><b>Please indicate if the following statements were true about you and your family during your childhood.</b><br/> <b>If this happened during your <u>childhood</u> (first 18 years of your life), please say 'Yes'. If this did not happen in your childhood, please say 'No.'</b></p> |                                                                   |                                                                              |
| 46.                                                                                                                                                                                                                                                                                        | You didn't have enough to eat.                                    | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 47.                                                                                                                                                                                                                                                                                        | You had to wear dirty clothes.                                    | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 48.                                                                                                                                                                                                                                                                                        | You felt that you had to shoulder adult responsibilities.         | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 49.                                                                                                                                                                                                                                                                                        | You felt that your family was under severe financial pressure.    | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 50.                                                                                                                                                                                                                                                                                        | One or more individuals kept important secrets or facts from you. | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 51.                                                                                                                                                                                                                                                                                        | People in your family looked out for each other.                  | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |
| 52.                                                                                                                                                                                                                                                                                        | Your family was a source of strength and support.                 | <input type="radio"/> Yes <sub>1</sub> <input type="radio"/> No <sub>0</sub> |

Reverse Score: 42, 43, 44, 45, 51, 52

### Appendix E: Monetary Choice Questionnaire (MCQ)

Now we are going to ask you to make some decisions about which of two rewards you would prefer. You will not receive the rewards that you choose, but we want you to make your decisions as though you were really going to get them. **Please take the choices seriously.** The reward choices will be shown to you. Choose your reward choice for each question and answer every question as though you will actually receive that choice. The choices you make are up to you.

|     |                  |          |    |                   |
|-----|------------------|----------|----|-------------------|
| 1.  | Would you prefer | \$54 now | or | \$55 in 117 days? |
| 2.  | Would you prefer | \$55 now | or | \$75 in 61 days?  |
| 3.  | Would you prefer | \$19 now | or | \$25 in 53 days?  |
| 4.  | Would you prefer | \$31 now | or | \$85 in 7 days?   |
| 5.  | Would you prefer | \$14 now | or | \$25 in 19 days?  |
| 6.  | Would you prefer | \$47 now | or | \$50 in 160 days? |
| 7.  | Would you prefer | \$15 now | or | \$35 in 13 days?  |
| 8.  | Would you prefer | \$25 now | or | \$60 in 14 days?  |
| 9.  | Would you prefer | \$78 now | or | \$80 in 162 days? |
| 10. | Would you prefer | \$40 now | or | \$55 in 62 days?  |
| 11. | Would you prefer | \$11 now | or | \$30 in 7 days?   |
| 12. | Would you prefer | \$67 now | or | \$75 in 119 days? |
| 13. | Would you prefer | \$34 now | or | \$35 in 186 days? |
| 14. | Would you prefer | \$27 now | or | \$50 in 21 days?  |
| 15. | Would you prefer | \$69 now | or | \$85 in 91 days?  |
| 16. | Would you prefer | \$49 now | or | \$60 in 89 days?  |

|     |                  |          |    |                   |
|-----|------------------|----------|----|-------------------|
| 17. | Would you prefer | \$80 now | or | \$85 in 157 days? |
| 18. | Would you prefer | \$24 now | or | \$35 in 29 days?  |
| 19. | Would you prefer | \$33 now | or | \$80 in 14 days?  |
| 20. | Would you prefer | \$28 now | or | \$30 in 179 days? |
| 21. | Would you prefer | \$34 now | or | \$50 in 30 days?  |
| 22. | Would you prefer | \$25 now | or | \$30 in 80 days?  |
| 23. | Would you prefer | \$41 now | or | \$75 in 20 days?  |
| 24. | Would you prefer | \$54 now | or | \$60 in 111 days? |
| 25. | Would you prefer | \$54 now | or | \$80 in 30 days?  |
| 26. | Would you prefer | \$22 now | or | \$25 in 136 days? |
| 27. | Would you prefer | \$20 now | or | \$55 in 7 days?   |

### Appendix F: Probability Money Choice Questionnaire

In the task that follows, you will have the opportunity to choose between reward amounts after different probabilities. You will not receive the rewards that you choose, but we want you to make your decisions as though you were really going to get them. Please take the choices seriously. The reward choices will be shown to you. Choose your reward choice for each question and answer every question as though you will actually receive that choice. The choices you make are up to you.

|    |                  |               |    |                                          |
|----|------------------|---------------|----|------------------------------------------|
| 1  | Would you prefer | \$20 for sure | OR | A 1-in-10 chance (10%) of winning \$80   |
| 2  | Would you prefer | \$20 for sure | OR | A 1-in-8 chance (13%) of winning \$80    |
| 3  | Would you prefer | \$20 for sure | OR | A 1-in-6 chance (17%) of winning \$80    |
| 4  | Would you prefer | \$20 for sure | OR | A 1-in-5 chance (20%) of winning \$80    |
| 5  | Would you prefer | \$20 for sure | OR | A 1-in-4 chance (25%) of winning \$80    |
| 6  | Would you prefer | \$20 for sure | OR | A 1-in-3 chance (33%) of winning \$80    |
| 7  | Would you prefer | \$20 for sure | OR | A 1-in-2 chance (50%) of winning \$80    |
| 8  | Would you prefer | \$20 for sure | OR | A 2-in-3 chance (67%) of winning \$80    |
| 9  | Would you prefer | \$20 for sure | OR | A 3-in-4 chance (75%) of winning \$80    |
| 10 | Would you prefer | \$20 for sure | OR | A 5-in-6 chance (83%) of winning \$80    |
| 11 | Would you prefer | \$40 for sure | OR | A 2-in-11 chance (18%) of winning \$100  |
| 12 | Would you prefer | \$40 for sure | OR | A 2-in-9 chance (22%) of winning \$100   |
| 13 | Would you prefer | \$40 for sure | OR | A 2-in-7 chance (29%) of winning \$100   |
| 14 | Would you prefer | \$40 for sure | OR | A 1-in-3 chance (33%) of winning \$100   |
| 15 | Would you prefer | \$40 for sure | OR | A 2-in-5 chance (40%) of winning \$100   |
| 16 | Would you prefer | \$40 for sure | OR | A 1-in-2 chance (50%) of winning \$100   |
| 17 | Would you prefer | \$40 for sure | OR | A 2-in-3 chance (67%) of winning \$100   |
| 18 | Would you prefer | \$40 for sure | OR | A 4-in-5 chance (80%) of winning \$100   |
| 19 | Would you prefer | \$40 for sure | OR | A 6-in-7 chance (86%) of winning \$100   |
| 20 | Would you prefer | \$40 for sure | OR | A 10-in-11 chance (91%) of winning \$100 |
| 21 | Would you prefer | \$40 for sure | OR | A 2-in-5 chance (40%) of winning \$60    |
| 22 | Would you prefer | \$40 for sure | OR | A 6-in-13 chance (46%) of winning \$60   |
| 23 | Would you prefer | \$40 for sure | OR | A 6-in-11 chance (55%) of winning \$60   |
| 24 | Would you prefer | \$40 for sure | OR | A 3-in-5 chance (60%) of winning \$60    |
| 25 | Would you prefer | \$40 for sure | OR | A 2-in-3 chance (67%) of winning \$60    |
| 26 | Would you prefer | \$40 for sure | OR | A 3-in-4 chance (75%) of winning \$60    |
| 27 | Would you prefer | \$40 for sure | OR | A 6-in-7 chance (86%) of winning \$60    |
| 28 | Would you prefer | \$40 for sure | OR | A 12-in-13 chance (92%) of winning \$60  |
| 29 | Would you prefer | \$40 for sure | OR | A 18-in-19 chance (95%) of winning \$60  |
| 30 | Would you prefer | \$40 for sure | OR | A 30-in-31 chance (97%) of winning \$60  |

## Appendix G: Psychological Inventory of Criminal Thinking Styles (PICTS)

(Version 4.0)

Glenn D. Walters, Ph.D.

Directions: The following items, if answered honestly, are designed to help you better understand your thinking and behavior. Please take the time to complete each of the 80 items on this inventory using the four-point scale defined below:

**4= strongly agree (SA)**

**3= agree (A)**

**2= uncertain (U)**

**1= disagree (D)**

|     |                                                                                                                                                                                | S<br>A | A | U | D |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|---|---|
| 1.  | I will allow nothing to get in the way of me getting what I want.....                                                                                                          | 4      | 3 | 2 | 1 |
| 2.  | I find myself blaming society and external circumstances for the problems I have had in life.....                                                                              | 4      | 3 | 2 | 1 |
| 3.  | Change can be scary.....                                                                                                                                                       | 4      | 3 | 2 | 1 |
| 4.  | Even though I may start out with the best of intentions I have trouble remaining focused and staying "on track" .....                                                          | 4      | 3 | 2 | 1 |
| 5.  | There is nothing I can't do if I try hard enough.....                                                                                                                          | 4      | 3 | 2 | 1 |
| 6.  | When pressured by life's problems I have said "the hell with it" and followed this up by using drugs or engaging in crime.....                                                 | 4      | 3 | 2 | 1 |
| 7.  | It's unsettling not knowing what the future holds                                                                                                                              | 4      | 3 | 2 | 1 |
| 8.  | I have found myself blaming the victims of some of my crimes by saying things like "they deserved what they got" or "they should have known better" ....                       | 4      | 3 | 2 | 1 |
| 9.  | One of the first things I consider in sizing up another person is whether they look strong or weak....                                                                         | 4      | 3 | 2 | 1 |
| 10. | I occasionally think of things too horrible to talk about.....                                                                                                                 | 4      | 3 | 2 | 1 |
| 11. | I am afraid of losing my mind.....                                                                                                                                             | 4      | 3 | 2 | 1 |
| 12. | The way I look at it, I've paid my dues and am therefore justified in taking what I want.....                                                                                  | 4      | 3 | 2 | 1 |
| 13. | The more I got away with crime the more I thought there was no way the police or authorities would ever catch up with me.....                                                  | 4      | 3 | 2 | 1 |
| 14. | I believe that breaking the law is no big deal as long as you don't physically hurt someone.....                                                                               | 4      | 3 | 2 | 1 |
| 15. | I have helped out friends and family with money acquired illegally.....                                                                                                        | 4      | 3 | 2 | 1 |
| 16. | I am uncritical of my thoughts and ideas to the point that I ignore the problems and difficulties associated with these plans until it is too late.....                        | 4      | 3 | 2 | 1 |
| 17. | It is unfair that I have been imprisoned for my crimes when bank presidents, lawyers, and politicians get away with all sorts of illegal and unethical behavior every day..... | 4      | 3 | 2 | 1 |
| 18. | I find myself arguing with others over relatively trivial matters....                                                                                                          | 4      | 3 | 2 | 1 |

|     |                                                                                                                                                                                    |   |   |   |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 19. | I can honestly say that the welfare of my victims was something I took into account when I committed my crimes.....                                                                | 4 | 3 | 2 | 1 |
| 20  | When frustrated I find myself saying "fuck it" and then engaging in some irresponsible or irrational act.....                                                                      | 4 | 3 | 2 | 1 |
| 21. | New challenges and situations make me nervous.....                                                                                                                                 | 4 | 3 | 2 | 1 |
| 22. | Even when I got caught for a crime I would convince myself that there was no way they would convict me or send me to prison.....                                                   | 4 | 3 | 2 | 1 |
| 23. | I find myself taking shortcuts, even if I know these shortcuts will interfere with my ability to achieve certain long-term goals.....                                              | 4 | 3 | 2 | 1 |
| 24. | When not in control of a situation I feel weak and helpless and experience a desire to exert power over others....                                                                 | 4 | 3 | 2 | 1 |
| 25. | Despite the criminal life I have led, deep down I am basically a good person.....                                                                                                  | 4 | 3 | 2 | 1 |
| 26. | I will frequently start an activity, project, or job but then never finish it.....                                                                                                 | 4 | 3 | 2 | 1 |
| 27. | I regularly hear voices and see visions which others do not hear or see...                                                                                                         | 4 | 3 | 2 | 1 |
| 28. | When it's all said and done, society owes me.....                                                                                                                                  | 4 | 3 | 2 | 1 |
| 29. | I have said to myself more than once that if it wasn't for someone "snitching" on me I would have never gotten caught.....                                                         | 4 | 3 | 2 | 1 |
| 30. | I tend to let things go which should probably be attended to, based on my belief that they will work themselves out.....                                                           | 4 | 3 | 2 | 1 |
| 31. | I have used alcohol or drugs to eliminate fear or apprehension before committing a crime.....                                                                                      | 4 | 3 | 2 | 1 |
| 32. | I have made mistakes in life.....                                                                                                                                                  | 4 | 3 | 2 | 1 |
| 33. | On the streets I would tell myself I needed to rob or steal in order to continue living the life I had coming....                                                                  | 4 | 3 | 2 | 1 |
| 34. | I like to be on center stage in my relationships and conversations with others, controlling things as much as possible...                                                          | 4 | 3 | 2 | 1 |
| 35. | When questioned about my motives for engaging in crime, I have justified my behavior by pointing out how hard my life has been.....                                                | 4 | 3 | 2 | 1 |
| 36. | I have trouble following through on good initial intentions.....                                                                                                                   | 4 | 3 | 2 | 1 |
| 37. | I find myself expressing tender feelings toward animals or little children in order to make myself feel better after committing a crime or engaging in irresponsible behavior..... | 4 | 3 | 2 | 1 |
| 38. | There have been times in my life when I felt I was above the law.....                                                                                                              | 4 | 3 | 2 | 1 |
| 39. | It seems that I have trouble concentrating on the simplest of tasks.....                                                                                                           | 4 | 3 | 2 | 1 |
| 40. | I tend to act impulsively under stress.....                                                                                                                                        | 4 | 3 | 2 | 1 |
| 41. | Why should I be made to appear worthless in front of friends and family when it is so easy to take from others.....                                                                | 4 | 3 | 2 | 1 |
| 42. | I have often not tried something out of fear that I might fail.....                                                                                                                | 4 | 3 | 2 | 1 |
| 43. | I tend to put off until tomorrow what should have been done today.....                                                                                                             | 4 | 3 | 2 | 1 |
| 44. | Although I have always realized that I might get caught for a crime, I would tell myself that there was "no way they would catch me this time"....                                 | 4 | 3 | 2 | 1 |
| 45. | I have justified selling drugs, burglarizing homes, or robbing banks by telling myself that if I didn't do it someone else would....                                               | 4 | 3 | 2 | 1 |

|     |                                                                                                                                                                              |   |   |   |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 46. | I find it difficult to commit myself to something I am not sure of because of fear                                                                                           | 4 | 3 | 2 | 1 |
| 47. | People have difficulty understanding me because I tend to jump around from subject to subject when talking...                                                                | 4 | 3 | 2 | 1 |
| 48. | There is nothing more frightening than change....                                                                                                                            | 4 | 3 | 2 | 1 |
| 49. | Nobody tells me what to do and if they try I will respond with intimidation, threats, or I might even get physically aggressive...                                           | 4 | 3 | 2 | 1 |
| 50. | When I commit a crime or act irresponsibly I will perform a "good deed" or do something nice for someone as a way of making up for the harm I have caused...                 | 4 | 3 | 2 | 1 |
| 51. | I have difficulty critically evaluating my thoughts, ideas, and plans.....                                                                                                   | 4 | 3 | 2 | 1 |
| 52. | Nobody before or after can do it better than me because I am stronger, smarter, or slicker than most people.....                                                             | 4 | 3 | 2 | 1 |
| 53. | I have rationalized my irresponsible actions with such statements as "everybody else is doing it so why shouldn't I"....                                                     | 4 | 3 | 2 | 1 |
| 54. | If challenged I will sometimes go along by saying "yeah, you're right," even when I know the other person is wrong, because it's easier than arguing with them about it..... | 4 | 3 | 2 | 1 |
| 55. | Fear of change has made it difficult for me to be successful in life.....                                                                                                    | 4 | 3 | 2 | 1 |
| 56. | The way I look at it I'm not really a criminal because I never intended to hurt anyone.....                                                                                  | 4 | 3 | 2 | 1 |
| 57. | I still find myself saying "the hell with working a regular job, I'll just take it"...                                                                                       | 4 | 3 | 2 | 1 |
| 58. | I sometimes wish I could take back certain things I have said or done....                                                                                                    | 4 | 3 | 2 | 1 |
| 59. | Looking back over my life I can see now that I lacked direction and consistency of purpose.....                                                                              | 4 | 3 | 2 | 1 |
| 60. | Strange odors, for which there is no explanation, come to me for no apparent reason.....                                                                                     | 4 | 3 | 2 | 1 |
| 61. | When on the streets I believed I could use drugs and avoid the negative consequences (addiction, compulsive use) that I observed in others.....                              | 4 | 3 | 2 | 1 |
| 62. | I tend to be rather easily sidetracked so that I rarely finish what I start...                                                                                               | 4 | 3 | 2 | 1 |
| 63. | If there is a short-cut or easy way around something I will find it....                                                                                                      | 4 | 3 | 2 | 1 |
| 64. | I have trouble controlling my angry feelings.....                                                                                                                            | 4 | 3 | 2 | 1 |
| 65. | I believe that I am a special person and that my situation deserves special consideration....                                                                                | 4 | 3 | 2 | 1 |
| 66. | There is nothing worse than being seen as weak or helpless                                                                                                                   | 4 | 3 | 2 | 1 |
| 67. | I view the positive things I have done for others as making up for the negative things...                                                                                    | 4 | 3 | 2 | 1 |
| 68. | Even when I set goals I frequently do not obtain them because I am distracted by events going on around me.....                                                              | 4 | 3 | 2 | 1 |
| 69. | There have been times when I tried to change but was prevented from doing so because of fear...                                                                              | 4 | 3 | 2 | 1 |
| 70. | When frustrated I will throw rational thought to the wind with such statements as "fuck it" or "the hell with it"...                                                         | 4 | 3 | 2 | 1 |
| 71. | I have told myself that I would never have had to engage in crime if I had had a good job.....                                                                               | 4 | 3 | 2 | 1 |

|     |                                                                                                                                                                                                                                     |   |   |   |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 72. | I can see that my life would be more satisfying if I could learn to make better decisions..                                                                                                                                         | 4 | 3 | 2 | 1 |
| 73. | There have been times when I have felt entitled to break the law in order to pay for a vacation, new car, or expensive clothing that I told myself I needed.....                                                                    | 4 | 3 | 2 | 1 |
| 74. | I rarely considered the consequences of my actions when I was in the community....                                                                                                                                                  | 4 | 3 | 2 | 1 |
| 75. | A significant portion of my life on the streets was spent trying to control people and situations.....                                                                                                                              | 4 | 3 | 2 | 1 |
| 76. | When I first began breaking the law I was very cautious, but as time went by and I didn't get caught I became overconfident and convinced myself that I could do just about anything and get away with it.....                      | 4 | 3 | 2 | 1 |
| 77. | As I look back on it now, I was a pretty good guy even though I was involved in crime.....                                                                                                                                          | 4 | 3 | 2 | 1 |
| 78. | There have been times when I have made plans to do something with my family and then cancelled these plans so that I could hang out with my friends, use drugs, or commit crimes.....                                               | 4 | 3 | 2 | 1 |
| 79. | I tend to push problems to the side rather than dealing with them...                                                                                                                                                                | 4 | 3 | 2 | 1 |
| 80. | I have used good behavior (abstaining from crime for a period of time) or various situations (fight with a spouse) to give myself permission to commit a crime or engage in other irresponsible activities such as using drugs..... | 4 | 3 | 2 | 1 |



## Appendix H: Jail Recruitment Form

Students from Idaho State University are interested in interviewing inmates for a study: Stressful Childhood Experiences and Decision Making

The purpose of this study is to investigate how stressful childhood experiences and previous drug use affects how someone thinks and behaves. We will interview 110 men in southeastern Idaho jails. Overall, the interview will take 45 to 90 minutes. We will be selecting individuals' names randomly-like picking a number out of a hat -so that everyone has an equal chance to be invited to participate. This is completely voluntary-it is up to you whether you choose to participate. We will call you out and explain the study and you can decide if you would like to take part or decline. We hope you choose to take part. Our goal is to use the findings to understand decision making processes that could help inform interventions for men in jail.

## Appendix I: Informed Consent

Idaho State University  
Human Subjects Committee

### **CONSENT TO PARTICIPATE IN RESEARCH**

Examining the Role of Impulsive Choice and Childhood Maltreatment in Thinking  
Processes Among Men in Jail

Dear Participant,

You are asked to volunteer for a research study conducted by Kathleen R. Smith and Steven R. Lawyer, Ph.D., (208-282-2142), from the Department of Psychology at Idaho State University. You have been asked to participate in this research because you are at least 18 years old, male, and incarcerated in Bannock County Jail. Your participation in this research is voluntary. Please read along with the information below, and ask questions about anything you do not understand, before deciding whether or not to participate.

#### **1. PURPOSE OF THE STUDY**

The purpose of this study is to investigate: how stressful childhood experiences, substance use, and decision-making are related to thought processes among men in southeastern Idaho jails.

#### **2. PROCEDURES**

If you volunteer to participate in this study, we will ask you to do the following things:

- I. Questionnaires: You will be asked to sign this consent form and complete several brief self-report measures about demographics, substance use, patterns of behaviors and your thoughts and behaviors.
- II. Decision-making tasks: You will complete behavioral choice tasks in which you will answer questions about your preference for different hypothetical monetary outcomes.
- III. Duration: Participation in the study may involve 45-90 minutes of your time.

If you volunteer to participate in this study, you will be asked questions about your stressful experiences in your life as a child including questions about whether you have experienced or witnessed violence or abuse. We also ask you to indicate types of crimes you have been charged with, your history of substance use, your preference for monetary outcomes, and questions related to how you think and behave.

Overall, we expect the interview and tests to take about 45 to 60 minutes. I will ask you the questions about your life, and you can answer, or you can tell me if you want to skip any questions, or just take a break. The things we talk about will be kept private. If you want to be in the study, there is a chance you might be upset by some of the personal questions. **YOU MAY SKIP ANY QUESTIONS** and you may **QUIT** the study **at any time**.

### 3. POTENTIAL RISKS AND DISCOMFORTS

There are risks involved in all research studies and the research procedures may involve risks that are currently unforeseeable. You may become uncomfortable thinking about previous stressful experiences and substance use. However, you understand that your participation is completely voluntary. You have been advised that you are free to withdraw from participation at any time or to choose not to participate at all and that by doing so you will not be penalized in any way.

One potential risk of being in the study involves loss of confidentiality or privacy. We will do everything we can to keep what you tell us confidential and private, including:

- 1) The jail staff will not have access to the information you provide in this study.
- 2) Your name will never be used in notes or reports from the study.
- 3) Your name will not appear on any of the questionnaires you complete here. The information we collect from you will be kept in a locked file drawer in a locked office. Computer information will be kept on a password-protected computer in a locked office that only people directly involved with the study can access.
- 4) Any report of the study will not identify you in any way. Your responses will be stored separately from any identifying information. All records will be stored in a locked facility at ISU for at least 7 years after completion of the study. After the storage time the information gathered will be destroyed.

What you tell us will be kept confidential with three exceptions:

- 1) We are **REQUIRED** to report if you tell us that you (or someone else) are about to hurt yourself or another person, and we are required to report if we believe ongoing abuse of a child, elder, or dependent adult occurred.
- 2) We are also **REQUIRED** to report if you disclose any current or previous sexual assault (which involves yourself or another person) while incarcerated *according to the Prison Rape Elimination Act (PREA)*. Jail personnel may conduct an investigation based on your disclosure, should you choose to report an incident of sexual assault that occurred during any incarceration.
- 3) It is possible the information might be subpoenaed from this study. In this event, we release the minimum information required. We also take several precautions to limit what information we collect from you and to protect your information. We store consent forms separately from your interview packets and do not record your name on the interview packet.

### 4. ANTICIPATED BENEFITS TO SUBJECT

There *may not* be direct benefits to you as a participant in this study. However, we hope to learn about how stressful life experiences can affect thoughts and behaviors. We hope these findings will improve services being offered to men in jail.

**5. ANTICIPATED BENEFITS TO SOCIETY**

Results of this research will be used to better understand how behavioral processes are associated with childhood life stressors and thought processes in adult behaviors.

**6. ALTERNATIVES TO PARTICIPATION**

An alternative is to not participate in the study.

**7. PAYMENT FOR PARTICIPATION (Bonneville County)**

To thank you for helping with our study, you will be offered a choice of snacks, like a candy bar. Due to jail regulations, you will have to eat the snack during the interview.

**7. PAYMENT FOR PARTICIPATION (Bannock County)**

To thank you for helping with our study, you will be offered one free 15 minute phone call. If you would like to accept the phone call you will have to sign an additional informed consent form allowing me to give you a form to give to jail staff with your name or inmate identification number to load this phone call to your account.

**8. WITHDRAWAL OF PARTICIPATION BY THE INVESTIGATOR**

The investigator or a research assistant may stop your participation in this study at any time if circumstances arise which warrant doing so. The investigators, Kathleen R. Smith and Steven R. Lawyer, Ph.D., will make the decision and let you know if it is not possible for you to continue. You may also be forced to withdraw if you do not follow the investigator's instructions.

### **Contact Information**

If you have any questions or concerns about the study, you may contact Kathleen R. Smith, or Steven R. Lawyer at (208) 282-2142. You are not waiving any legal claims, rights or remedies because of your participation in this research study. For questions regarding the or comments regarding the manner in which the study is being conducted you may contact the **ISU Human Subjects Committee Office at 208-282-2179.**

### **Voluntary Participation**

Your participation in this study is voluntary - it is up to you if you want to talk with me and participate. You may refuse to participate in this study or in any part of this study and it will NOT change how you are treated by the jail, the courts, or the probation/parole board. You are encouraged to ask questions about this study at the beginning or any time during the research study.

|                                                  |
|--------------------------------------------------|
| <b>INDICATION OF CONSENT BY RESEARCH SUBJECT</b> |
|--------------------------------------------------|

I am 18 years or older and have read (or someone has read to me) and understood the information provided above. I have been given a chance to ask questions about this research study, and all of my questions have been answered to my satisfaction. I have been offered a copy of this form for my own records.

**BY SIGNING BELOW, I WILLINGLY AGREE TO PARTICIPATE IN THE RESEARCH.**

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant Name (Please Print)

\_\_\_\_\_ I agree that my anonymous responses and data can be used in future studies.

\_\_\_\_\_ I do not agree to the use of my anonymous responses and data in future studies.

Contact information for The Mediating Role of Impulsive Choice between Childhood Maltreatment and Criminal Thinking

- To contact Kathleen R. Smith, or Steven R. Lawyer
  - Department: Psychology
  - Address: Idaho State University, 921 SO 8<sup>th</sup> Ave, STOP 8112, Pocatello ID, 83209
  - Phone Number: 208-282-2462
- To contact Idaho State University Human Subjects Committee:
  - Chair: Ralph Baergen
  - Address: Idaho State University, 921 SO 8<sup>th</sup> Ave, STOP 8112, Pocatello ID, 83209
  - Phone Number: 208-282-2179

**Resources**

**Suicide Crisis hotline (National Hopeline Network): 1-800-784-2433**

**Alcohol and Drug Abuse Helpline and Treatment: 1-800-234-0420**

**Bannock County Compensation Form**

**BY SIGNING BELOW, I WILLINGLY AGREE TO GIVE A FORM TO JAIL STAFF, SHARING MY NAME OR INMATE ID NUMBER, FOR COMPENSATION FOR PARTICIPATION IN THE RESEARCH.**

---

Signature of Participant

---

Date

---

Participant Name (Please Print)

---

Inmate ID number

\_\_\_\_\_ I agree to provide the jail staff with a form that informs them of my participation in this study in exchange for one free phone call, which will be loaded to my account by jail staff.

I understand that no other information about myself or my responses in this study will be provided to the jail staff.