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THE ROLE OF EMOTIONAL ATTENTION REGULATION IN HIGH PSYCHOPATHY INCARCERATED MALES

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Abstract

This study examined the role of emotional attention regulation in men ($N = 60$) currently incarcerated in a Midwestern prison. Modern conceptualizations define psychopathy as a multifaceted and dimensional construct that includes atypical experience of affect, interpersonal problems, and remarkable social deviance. Attentional differences and deficient emotional experience have been shown to predict psychopathy and other outcomes related to the construct. However, attentional and emotional functioning in individuals high in psychopathy is complex and results have been shown to vary across discrete emotion states and experimental paradigms. The negative preception hypothesis (Kosson et al. 2018) suggests that these differences may be the result of regulation of attention *away* from emotional experience as opposed to a general diminished emotional responsiveness, resulting in poor establishment of affect – consequence relationships and an overall impoverished emotional life. Deficits in tuning into nonverbal cues (TINC) and tuning out nonverbal cues (TONC) did not predict scores on an interview-based measure of psychopathy (PCL:SV). However, exploratory analyses with a self-report measure of psychopathy (TriPM) suggest deficits in these skills may be relevant in the context of alternate models of psychopathy. These results highlight the importance of accurately defining and understanding the heterogeneous construct of psychopathy and suggest that an inability to modulate attention toward or away from nonverbal emotional cues may exhibit distinct relationships with differing phenotypic components of the construct. Specifically, deficits relating to tuning into emotional cues may speak to an adaptive element of boldness in the triarchic psychopathy conceptualization while performance related to tuning out nonverbal cues was inversely related with a scale measure of meanness, callousness, and aggression.

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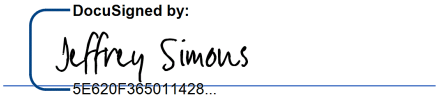

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Introduction

Psychopathy exacts a massive toll on society and the criminal justice system. Nonetheless, portraits of "psychopaths" are commonly blended into pop culture and sensationalized throughout media for sake of morbid curiosity and entertainment. Despite the interest and intrigue in psychopathy from the general population, our theoretical understanding of this multifaceted clinical construct is far from complete. While interest in individuals who are manipulative, superficial, glib, lack empathy and remorse, and disproportionately commit instrumental and reactive acts of violence dates back to the early 1950's (Cleckley, 1951), recent pushes have significantly advanced our understanding of psychopathy through employment of neuroimaging technology, advanced statistical methods, and novel experimental approaches that have broadened our understanding of social, emotional, and behavioral deficits related to the construct. Though psychopathy is relatively rare, estimates suggest that a relatively small number of individuals high in psychopathy are responsible for a disproportionate amount of crime (Anderson, Walsh, & Kosson, 2018; Coid, Yang, Ullrich, Roberts, & Hare, 2009; Hare, 2006, 2016; Hare & Neumann, 2009). Furthermore, individuals high in psychopathy experience worse treatment outcomes and are more likely to fail conditional release programs while transitioning out of prison (Brook, Brieman, & Kosson, 2013; Porter, Birt, & Boer, 2001). Psychopathy is both dangerous and costly (Brook et al., 2013). Thus, understanding of etiological factors, affective and cognitive differences or deficits, and other mechanisms related to psychopathy that result in antisocial behavior may aid in identification and treatment of offenders, and is of great importance to the criminal justice system and society as a whole.

While the definition of psychopathy has evolved over time, contemporary models of the construct define dual processes of relevance to psychopathy in which there are distinct

interpersonal/affective (Factor 1) and antisocial/lifestyle (Factor 2) deficits (Dindo & Fowles, 2011; Hare, Neumann, & Mokros, 2018). This allows for a great deal of heterogeneity in the construct due to the complex constellation of interpersonal and affective deficits alongside traits related to disinhibition (e.g. impulsivity, irresponsibility). Indeed, different "subtypes" or different presentations have been supported throughout literature, further obscuring issues related to studying and understanding aspects of psychopathy. The two emerging subtypes consistent in the literature are primary and secondary psychopathy. Primary psychopathy involves a more hostile, aggressive, confident, narcissistic, and low anxiety presentation while secondary psychopathy is generally more associated with higher negative affectivity, lower self-esteem, and more comorbid mental health problems (Hicks & Drislane, 2018; Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012). Identifying mechanisms underlying all forms of psychopathy as well as potential methods of differentiating them is essential in further understanding atypical interpersonal, affective, and social deviancy relevant to the construct.

Perhaps the most central component of psychopathy as a clinical construct is deficient emotional experience (Brook et al., 2013). Violent offenders report higher levels of difficulty identifying feelings and emotional nonacceptance than non-offender populations, with difficulties identifying and describing feelings being a significant factor in explaining variance in physical aggression and hostility (Garofalo, Velotti, & Zavattini, 2017). Difficulties regulating emotions (e.g., lack of awareness of emotions, lack of emotional clarity, difficulty refraining from impulsive behavior when upset, etc.) extend to psychopathy with a positive linear relationship to the construct as a whole as well as independently to the antisocial, lifestyle, and affective facets (Garofalo, Neumann, & Velotti, 2018). Difficulty regulating one's emotions has also been shown to mediate the relationship between psychopathic traits and impulsive

aggression (Long, Felton, Lilienfeld, & Lejuez, 2014). Overall, individuals high in psychopathic traits tend to exhibit atypical behavioral, psychophysiologic, and brain region activation while processing emotions (Brook et al., 2013). This suggests a consistent and broad deficit in terms of ability to process and regulate emotions for those high in psychopathy. However, differences in effect sizes across specific emotions, subtypes of psychopathy, and experimental paradigms can be modest or inconsistent across studies (Brook et al., 2013). Thus, it is important to determine mechanisms that underlie these emotional deficits and shine light on why differences between processing certain emotions (e.g. fear vs happiness) or under different contexts may exist.

Another mechanism that is widely supported as relevant to psychopathy is attention allocation (Glenn & Raine, 2014; Hoppenbrouwers, Van der Stigchel, Sergiou, & Theeuwes, 2016; Kosson & Harpur, 1997; Newman, Curtin, Bertsch, & Baskin-Sommers, 2010; Zeier & Newman, 2013). Individuals high in psychopathic traits exhibit considerable deficits in the allocation of attentional resources and overall inhibitory control across self-report measures, laboratory tasks, and brain imaging studies (Glenn & Raine, 2014; Patrick, 2018a; Venables et al., 2018). Indeed, poor ability to attend to external stimuli in the early stages of perceiving information has been linked to core components of psychopathy such as callousness, fearlessness, and social dominance while problems with executive functioning and cognitive control have been linked to risk-taking and negative affectivity (Sadeh & Verona, 2008). Attentional functions are theorized to be strongly affected by motivation, especially in those high in psychopathic traits (Kosson & Harpur, 1997). This dysfunction is posited to be an explanatory factor in the limited or disengaged fear responses observed in individuals high in psychopathic traits, as peripheral information such as fear stimuli (or other emotionally bound cues) are inefficiently attended to (Newman et al., 2010; Zeier & Newman, 2013).

The body of research on psychopathy emphasizes distinct cognitive and affective processes that underlie the atypical functioning (e.g., poor empathy, shallow affective experience, disinhibited behavior) commonly attributed to the construct of psychopathy. One potentially relevant mechanism that integrates both affective and cognitive aspects is ability to effectively regulate attention to one's emotional experience. Failure to efficiently modulate attention toward or away from salient emotional cues may facilitate misinformed or deficient processing of information in which emotional cues are valuable (Schwarz & Clore, 1988) or result in the improper selection of regulation strategies (e.g., substance use, interpersonal aggression, etc.; Ford, Lwi, Gentzler, Hankin, & Mauss, 2018). For example, an individual who has difficulty directing attention towards emotional experience may fail to identify the emotion in situations where such a skill is adaptive, thus resulting in an improper call to regulate emotion internally or in others. Conversely, difficulty tuning out emotional experiences may result in emotions that are intrusive, distracting, or distressing, and result in maladaptive behavior that serves the purpose to correct the emotional response. General difficulties in regulating attention to emotions are generally associated with impulsive behavior, poor emotion regulation strategies, and other forms of psychopathology (Berenbaum, Boden, & Baker, 2009; Boden & Thompson, 2015; Huang, Berenbaum, & Chow, 2013). Deficits in this ability may also underlie the atypical cognitive and affective features associated with psychopathy. Difficulties in attending to emotional cues or experience is consistent with the negative preception hypothesis of psychopathy (Kosson, McBride, Miller, Riser, & Whitman, 2018). The core tenet of this theory is that individuals high in psychopathic traits attenuate the impact of noxious stimuli (or aversive internal states) as an active coping process. While the attenuation may achieve reduction in the intensity of negative affective responses, it may also result in a reliance on the strategy through

negative reinforcement. Similarly, it may ultimately contribute to problematic developmental outcomes such as impoverished emotional functioning as the attenuation process becomes automatized. Though there are competing views on the etiology of emotional attention deficits, recent studies indicate that attention to affective stimuli is attenuated for those high in interpersonal / affective and disinhibited traits of psychopathy (Kimonis, Kidd, Most, Krynen, & Liu, 2019; Kosson et al., 2018). This raises questions on if this intersection between attention and emotions is of relevance to the construct of psychopathy above a general problem with attentional processing, and if modulating attention towards or away from emotions is impaired in those that exhibit the affective and disinhibited traits of psychopathy.

The literature review is organized into three main sections. First, it will review psychopathy as a multifaceted clinical construct of specific concern to the criminal justice system. Second, there will be a review of contemporary theory of psychopathy including etiological mechanisms relevant to the construct and specific variants of psychopathy. The third section highlights the prevalence of externalizing, disinhibited, affective, and interpersonal deficits associated with the construct. Finally, a review of the intersection of cognition and emotion regulation processes in psychopathy will be discussed, proposing a potentially relevant intersection of these aspects: attention *to* emotions.

Foundations of Psychopathy as a Clinical Construct

Despite a relatively low prevalence rate in the general population, psychopathy exacts a massive toll on society and particularly the criminal justice system (Anderson et al., 2018; Blais, Solodukhin, & Forth, 2014; Coid et al., 2009). While less than 1% of the population is estimated to meet criteria for psychopathy, individuals high in psychopathic traits are disproportionately represented in prison populations as they are estimated to make up around 10-15% of the

incarcerated population (Coid et al., 2009). One study found that individuals who scored 13 and above on the PCL:SV, a measure of psychopathy with scores that can range from 0 – 24, were 5.3 times more likely to commit a violent act than those below the threshold (Silver, Mulvey, & Monahan, 1999). Research also indicates individuals high in psychopathy are more likely to perpetrate both reactive (i.e., hot, in the moment) violence and instrumental (i.e., controlled, proactive, predatory) violence (Blais et al., 2014). Psychopathy has also been linked to numerous forms of other specific crimes and types of violence. For instance, a study of 172 individuals incarcerated in a county jail found that those high in psychopathic traits (specifically with diminished affective experience traits) were more likely to commit domestic violence compared to those high in antisocial traits but low in psychopathy (Swogger, Walsh, & Kosson, 2007). Similarly, individuals high in psychopathy are also more likely to commit acts of sexual violence (Harris, Rice, Hilton, Lalumière, & Quinsey, 2007). Non-violent offenses such as stealing, drug offenses, and property crimes are also committed at disproportionate rates by those high in psychopathy in comparison to other offenders, meaning that individuals who are higher in psychopathy are more likely to commit non-violent offenses than those who are not high in psychopathy (Anderson et al., 2018; Olver & Wong, 2015). Furthermore, individuals high in psychopathic traits are also more likely to experience problems while incarcerated such as institutional misconduct or violence (Guy, Edens, Anthony, & Douglas, 2005) and higher dropout rates in mandated treatment while incarcerated (Olver & Wong, 2011). This suggests that individuals high in psychopathic traits are disproportionately represented in the criminal justice system due to an increased likelihood of committing violent and non-violent violations of laws compared to those low in psychopathic traits. It is evident that the impact of psychopathy is substantial for both society and corrections.

The genesis of the word "psychopathy" dates as far back as the late 19th century as a term used to loosely describe aggressive and irresponsible behavior (Buzina, 2012). In the following decades, similar terms were used to describe generally disinhibited and aggressive behavior. However, the modern conceptualization of psychopathy emerged in 1941 when Hervey Cleckley published *The Mask of Sanity*. Cleckley detailed a disorder that included both the credible appearance of psychological normality that "masked" severe pathology characterized by reckless and unrestrained behavior across multiple life domains (Cleckley, 1941; Patrick, 2018c). He continued by assigning criteria for the construct such as: superficial charm and good intelligence, absence of nervousness, unreliability, failure to follow any life plan, lack of remorse or shame, poverty in affective reactions, and unresponsiveness in general interpersonal relations. This early work set the stage for theoretical advancement in psychopathy and has remained relatively consistent with contemporary models of psychopathy today. These models similarly integrate four main deficient areas in individuals high in psychopathy: affective, interpersonal, lifestyle, and antisocial behavior (Dindo & Fowles, 2011; Hare, 2003; Hare et al., 2018; Patrick, 2018c).

In some respects, the operationalization of psychopathy remains a point of contention today. The initial American Psychiatric Association (APA, 1952) classification of the "antisocial psychopath" described one who is "always in trouble, does not benefit from experience or punishment, is disloyal to everybody, and does not respect social norms (Buzina, 2012). Subsequent versions of the diagnostic manual have also integrated ideas of sociopathic personality in which there is a remarkable misalignment with society and conformity. This indicates a reliance on more interpersonal and affective characteristics such as being charming and manipulative. However, subsequent revisions of the Diagnostic and Statistical Manual (APA, 1987, 2000) moved further away from psychopathy as a diagnosis, aligning criteria more

with antisocial personality characteristics that prioritizes behavioral criterion such as impulsivity, aggressiveness, and a reckless disregard for safety of self or others (Crego & Widiger, 2015). Currently, psychopathy as a disorder is notably absent from the current DSM-5 despite concern that it presents as a distinct construct apart from antisocial personality disorder (Buzina, 2012). Recent research suggests that psychopathy as a disorder may be better characterized under the DSM-5's alternative model for personality disorders as a dimensional disorder (Drislane et al., 2019). Instead, it is presented as a specifier "with psychopathic features," for antisocial personality disorder (ASPD) under the alternative model for emerging diagnoses requiring further study section (APA, 2013). ASPD, a cluster B personality disorder characterized by behavioral disinhibition, history of criminal behavior, aggressiveness, irresponsibility, and lack of remorse (APA, 2013), has several commonalities with psychopathy. However, ASPD also emphasizes behavioral traits over interpersonal and affective deficits believed to be the core feature in psychopathy (Buzina, 2012). While up to 80% of the criminal population ostensibly meet criteria for ASPD, the rate at which this population would meet criteria for psychopathy via the PCL-R is much lower at 15% (Hare, 2003). Furthermore, the relationship between ASPD and psychopathy appear to be asymmetrical as a much smaller percentage of those high in antisocial traits would also meet criteria for psychopathy as operationalized by the PCL-R compared to a very high percentage of incarcerated individuals who are elevated in psychopathic traits that would also qualify for ASPD diagnosis (Buzina, 2012; Hare, 2003; Ogloff, 2006). Thus, psychopathy appears to be a particularly problematic progression of ASPD in which emotional callousness and interpersonal deficits differentiate it from impulsive and disinhibited disorders. This affective and interpersonal distinction highlights a particular population that presents additional challenges in society and within prisons. Indeed, individuals with significant

psychopathic traits are much more likely to perpetrate violence compared to non-psychopathic individuals in the correctional population (Hare, Clark, Grann, & Thornton, 2000; Silver et al., 1999). Further study of etiological mechanisms related to psychopathy is also required.

Genetic Contributions to Psychopathy

There is significant evidence that traits consistent with psychopathy and more broadly antisocial behavior are heritable (Waldman, Rhee, LoParo, & Park, 2018). For example, twin and family studies suggest general aggression is believed to have a heritability of between 44% - 72% (Seroczynski, Bergeman, & Coccaro, 1999; Siever, 2008). Schizophrenia a disorder widely understood to have strong genetic influences, is assumed to have around 81-85% of the variance of liability in developing the disorder attributed to genetic factors (Kläning et al., 2016). Though this is higher than the estimates for antisocial behavior, the genetic component of antisociality is still significant. A meta-analysis of 149 studies containing 55,525 pairs of twin participants (Rhee & Waldman, 2002) identified additive genetic influence ($a^2 = 0.32$) and nonshared environmental (i.e., things not shared between twins such as abuse, neglect, etc.) influences ($e^2 = 0.43$) as predominant predictors of antisociality more so than shared environmental ($c^2 = 0.16$) and nonadditive genetic influences ($d^2 = 0.09$). In studies strictly examining psychopathy, additive genetic influence and nonshared environmental influences remained clearly more important than shared environmental and nonadditive genetic influences. In a more recent twin and triplet study (Bezdjian, Raine, Baker, & Lynam, 2011), researchers replicated the importance of genetic and nonshared environmental influences in the presence of psychopathic traits in children. Furthermore, they found an association between male gender and higher estimates of heritability for callous and unemotional traits but lower inheritability for manipulative and deceitful traits. Higher antisocial hereditability was also found when accompanied by callousness

and unemotional traits as opposed to not (Rhee & Waldman, 2002). Several gene variants have also been linked to psychopathy (Waldman et al., 2018). For example, gene variants that affect COMT (catechol-0-methyltransferase), MAOA (monoamine oxidase), and 5HTT (sodium-dependent serotonin transporter) activity have been linked to emotional dysfunction, callous emotionality, and total psychopathy scores in adolescents diagnosed with ADHD (Fowler et al., 2009). However, these results are also attributable to a diagnosis of conduct disorder. While genetic contributions in antisocial behavior and callous unemotionality are ubiquitous throughout the literature, environmental and learning experiences may also provide additional etiological explanation for the construct of psychopathy.

Environmental Contributions to Psychopathy

With genetic predisposition being a predictor of psychopathy and antisocial behavior as a whole, it is also important to consider environmental contributions to the construct. The literature suggests family factors are an important predictor of future law violating behavior (Fowler et al., 2009). Numerous constructs tied to family upbringing have been tied to violation of laws, violence, and high scores on measures of psychopathy. This includes socioeconomic factors, child rearing problems, parental rejection, physical or sexual abuse, and prior parental conflict (Fowler et al., 2009). In one 4-year longitudinal study of adolescents, poor quality parenting and socioeconomic status were the most consistent predictors of stability of psychopathic traits (Frick, Kimonis, Dandreaux, & Farell, 2003). In another study of incarcerated males, early abuse was directly related to the impulsivity and irresponsible lifestyle scale on the PCL-R (Poythress, Skeem, & Lilienfeld, 2006). Early parental abuse and other negative familial factors (such as violence or conflict between parents, substance use, etc.) particularly appear to have an adverse effect on development and contribute to the maintenance of antisocial and

psychopathic traits. In addition, many genetic factors may be more expressive under particular environmental factors (Moffitt, 2005) such as child rearing and abuse. However, contributing environmental factors are far from explaining the full range of deficits observed in those high in psychopathy, nor do they explain the mechanisms that underlie the cold, unemotional, and disinhibited behavior commonly attributed to the construct.

Contemporary Theory of Psychopathy

The study of psychopathy has increased exponentially over the past several decades as technological and statistical advancements allow for new and exciting developments in our understanding of the construct (Patrick, 2006, 2018b). Consistent with trends in personality theory, psychopathy is widely considered to be a dimensional as opposed to taxonic construct (Patrick, 2018c; Walters, Marcus, Edens, Knight, & Sanford, 2011). One important aspect of this is the agreement of well-defined methods for measuring psychopathy. In clinical, correctional, and research settings, the most prevalent measure of psychopathy is the Psychopathy Checklist – Revised (PCL-R; Hare, 2003). The PCL-R is often used as an important tool for aiding decisions in parole determination, risk assessment, sexually violent predator evaluations, and legal decisions (Hare et al., 2018). The instrument, which is completed by an evaluator and is interview based, contains 20 items with the purpose of "capturing" psychopathic traits, with each item being rated on a 3-point ordinal scale (Hare, 2016; Hare et al., 2018). The measure has a factor structure in which each facet reflects distinct symptoms of psychopathy (Hare, 2003; Patrick, 2018c).

The items on the PCL-R (and screening version (PCL:SV) are organized into four theoretically and conceptually based facets that comprise two higher order factors. The facets include items for interpersonal, affective, lifestyle, and antisocial deficits. Interpersonal items

include glibness / superficial charm, grandiose sense of self-worth, pathological lying, and conning / manipulativeness. Affective items include a lack of remorse or guilt, shallow affect, callousness / lack of empathy, failure to accept responsibility. These two facets combine to create "Factor 1", reflective of the affective interpersonal deficits consistent with Cleckley's (1941) theorized *Mask of Sanity* and the breadth of research suggesting severe emotional dysfunction and behavioral fearlessness (Dindo & Fowles, 2011; Wallace, Malterer, & Newman, 2009). Alternatively, the lifestyle facet includes items for need for stimulation, parasitic lifestyle, no realistic long-term goals, impulsivity and irresponsibility. Antisocial items include poor behavioral controls, early behavioral problems, juvenile delinquency, revocation of conditional release, and criminal versatility. The lifestyle and antisocial facets create "Factor 2", more indicative of severe antisocial personality orientation, disinhibited behavior, and a proneness to externalizing (Fowles & Dindo, 2006; Hare et al., 2018; Nelson & Foell, 2018).

All four facets are moderately to highly correlated, with the highest being between the lifestyle and antisocial items (Hare, 2016). This model of psychopathy, and in particular the Factor 1 and Factor 2 structure, is consistent with the dual dispositional theory of psychopathy (Fowles & Dindo, 2006) that states two dispositional qualities, disinhibition and boldness, are unique attributes where one likely represents extreme tendency to exhibit externalizing behavior while the other is more reflective of boldness and fearlessness. To this effect, the boldness and fearless aspect similar to the PCL-R's Factor 1 may suppress the neurotic and internalizing behavior common to externalizing psychology (Factor 2) and manifest in criminal / antisocial behavior (Patrick, 2018c). Hare's (2003) conceptualization of psychopathy is the most prevalent throughout the literature as a general index of psychopathic traits. However, there are several other contemporary models that attempt to explain the phenomenon of psychopathy. These

generally incorporate similar features of affective deficits and historical antisocial behavior. The Triarchic Model of Psychopathy (Patrick, Fowles, & Krueger, 2009) is another conceptualization of psychopathy that follows a similar structure. This model differentiates core features of psychopathy into three categories: disinhibition, callousness-unemotionality (meanness), and boldness. This separates abnormal affective functioning into both a lack of ability to reflect on emotional experience and general callousness from a remarkable lack of fear in psychopathy. Because psychopathy is generally defined as multifaceted and multidimensional, both the Hare (2003) conceptualization and other contemporary models of psychopathy introduce the potential for heterogeneous presentations of the construct from one individual to the next.

Variants of Psychopathy

An issue further obscuring difficulties related to the study and operationalization of psychopathy as a clinical construct is the prevalence of "subtypes" of psychopathy. A common misconception is that psychopathy refers to a single distinct diagnostic presentation, when in fact there is significant heterogeneity in the construct (Hicks & Drislane, 2018). Though this area of research is underdeveloped, it is important to understand potential variants of psychopathy as they may illuminate inconsistent findings throughout the literature regarding etiological processes as well as cognitive and affective mechanisms in psychopathy (Hicks & Drislane, 2018; Patrick, 2018b). Most contemporary models of psychopathy acknowledge this heterogeneity and address two emergent subtypes, primary and secondary psychopathy. Primary psychopathy is generally conceptualized similarly to Hervy Cleckley's (1941) prototypical psychopath who demonstrates low anxiety, narcissism, and remarkable affective deficits (Hicks & Drislane, 2018; Kimonis et al., 2012; Newman, MacCoon, Vaughn, & Sadeh, 2005; Olver, Sewall, Sarty, Lewis, & Wong, 2015). Conversely, secondary psychopathy is commonly linked

to the disinhibited and high anxiety components of the disorder (Hicks & Drislane, 2018; Kimonis et al., 2012; Newman et al., 2005; Olver et al., 2015).

While these variants are predictive of many of the same criminogenic outcomes, many of the etiological pathways and underlying mechanism likely vary between primary and secondary variants. The strongest component in differentiating these two variants is negative emotionality (i.e., anxiety, neuroticism, anger; Hicks & Drislane, 2018). Differentiation has also been shown in how variants of psychopathy process fear and stress. Specifically, significant differences in the behavioral activation system (BAS) and behavioral inhibition system (BIS; Gray, 1987) have been observed in presentations of psychopathy. Primary psychopathy is associated with weakened BIS functioning and typical BAS functioning, while secondary psychopathy is associated with significantly higher BAS scores and modest elevations of BIS scores (Newman et al., 2005; Wallace et al., 2009). Therefore, primary psychopathy is more aligned with deficient punishment sensitivity and fearlessness, while secondary psychopathy is more sensitive to reward cues and behavioral approach (Gray, 1987; Newman et al., 2005). Secondary psychopathy is generally associated with negative emotionality, reactivity, impulsive substance use, attentional problems, and is also more closely related to childhood physical and sexual abuse, depression, anxiety, and posttraumatic stress symptoms, whereas primary psychopathy is posited to be less engaged by emotionally laden stimuli, fearlessness, grandiose, and low harm-avoidance (Hicks & Drislane, 2018; Kimonis et al., 2012; Olver et al., 2015; Wallace et al., 2009; Waller & Hicks, 2018). While the profile of secondary psychopathy may seem consistent with conduct and antisocial behavior as a whole, individuals classified under secondary psychopathy still exhibit callous-unemotional traits core to psychopathy which differentiates them from traditional individuals high on antisocial traits. However, there may be different

etiological pathways in which a primary type is more is more associated with a deficit in processing distress cues while a secondary type is more attributable to negative affectivity and histories of abuse (Kimonis et al., 2012). Identifying subtypes or variants in psychopathy is essential in reducing heterogeneity and appropriately researching the construct. Similarly, understanding relevant psychological mechanisms inherent to both variants is important for future treatment implications, diagnostic criterion, and risk prediction.

Affective and Interpersonal Deficits

Core to all modern models of psychopathy is a hallmark deficiency in emotional processing (Cleckley, 1941; Hare, 2003; Patrick et al., 2009). This affective deficit is captured by Factor 1 of the PCL-R as well as the construct of meanness (callous-unemotional traits) in the triarchic model of psychopathy. Most studies examining emotional functioning in high psychopathy individuals conclude there are anomalous patterns of responsivity to emotional cues as indicated by differences in behavioral, psychophysiological, and regional brain activation compared to controls (Brook et al., 2013; Glenn & Raine, 2014). However, there are competing views on if an emotional deficit is a general problem with processing emotions overall or more specific to particular emotions. For example, some perspectives suggest individuals high in psychopathic traits may have impaired sense of sadness and fear related to interpersonal distress cues (Blair, 2005) as opposed to a general deficit in experiencing emotion. While a meta-analysis (Brook et al., 2013) found trends of diminished responsiveness to emotional cues in psychopathy, there was substantial variability in effect sizes dependent on emotion type and participant samples. Pooled effect sizes in studies examining responsiveness to specific emotions found that fear (d = -0.56) and disgust (d = -0.44) held the strongest effect sizes while happiness (d = -0.33) and anger (d = -0.30) were considerably weaker (Brook et al., 2013; Igoumenou,

Harmer, Yang, Coid, & Rogers, 2017). Furthermore, there appeared to be a stronger effect for emotionally based performance deficits when studies required responses to emotional language as opposed to nonverbal emotional stimuli such as faces or emotionally evocative stimuli (Brook et al., 2013). Another meta-analysis found similar trends of pervasive impairments in facial and vocal recognition, as well as in facial, vocal, and postural studies (Dawel, O'Kearney, McKone, & Palermo, 2012). Similarly, fMRI observation has suggested differences in psychopathic processing of emotional stimuli compared to controls (Hoff, Beneventi, Galta, & Wik, 2009). In this study, regional brain activations while observing emotional images were shown to involve less activation of high-level cognitive functioning and more activation of primitive brain regions in individuals high in psychopathy. Often this is attributed to amygdala dysfunction that has been linked to emotional selective deficits in emotional empathy and processing sad, fearful, and disgusted expression (Blair, 2005). The body of literature supporting a clear deficiency in how those high in psychopathic traits process emotions is vast, with poor responsivity to various emotional stimuli evidenced across experimental, self-report, and neurological approaches. However, there are numerous studies in which results are modest or inconsistent, such as discrepant findings regarding specific emotional states or different experimental approaches (e.g., startle reflex & physiological arousal vs. affect recognition paradigms). Further research into the mechanisms underlying consequent regulation of emotional responses and differences across varying emotional states is required.

Emotion Regulation in Psychopathy

Emotional dysfunction is a clear central feature of psychopathy. However, the extent to which emotion dysregulation plays a role in psychopathy is less clear. While it may seem at odds that affective features of psychopathy (i.e., shallow affective experience, lack of empathy and

remorse) are related to dysregulated affect, how affect is regulated is relevant to both Factor 1 and 2 and may vary as a function of the variant or subtype of psychopathy as well as the prevalence of externalizing behavior. Indeed, traits related to psychopathy (cold-heartedness, self-centered impulsivity, and fearless dominance) are differentially associated with difficulty in regulating emotions (e.g., lack of emotional clarity, limited regulation strategies, and nonacceptance of emotional responses), with this difficulty regulating emotions mediating the relationship of psychopathic traits to impulsive acts of aggression but not premeditated aggression (Long et al., 2014). Difficulty identifying feelings, emotional nonacceptance, and negative urgency all uniquely contribute to aggression in violent offenders (Garofalo et al., 2017). Problems related to emotion regulation are also robust predictors of other externalizing behavior such as substance use, interpersonal aggression, and conduct problems (Belcher, Volkow, Moeller, & Ferré, 2014; Simons, Wills, Emery, & Spelman, 2016; Wills, Simons, Sussman, & Knight, 2016). This suggest that emotion dysregulation may be a potential link between general antisocial behavior and, more specifically, acting aggressively. This disinhibited behavior is consistent with the social deviancy Factor 2 subscale of the PCL-R. However, emotion dysregulation has also been shown to extend to the interpersonal-affective components of the construct over and above the level of psychological distress and externalizing behavior (Garofalo et al., 2018). Thus, some aspects of emotion dysregulation underlie both core components of psychopathy.

Externalizing and Disinhibition

Core to any variant of psychopathy is a significant tendency to exhibit externalizing behavior. Externalizing proneness, a construct that incorporates impulse control problems of various types and affiliated traits, has much in common with the social deviancy factor

(antisocial and lifestyle, Factor 2) of the PCL-R (Hare, 2003) and disinhibition element of the triarchic model of psychopathy (Nelson & Foell, 2018; Patrick et al., 2009). Disinhibited behavior includes a propensity towards impulsive action, lack of planning or foresight, and poor behavioral restraint (Patrick et al., 2009). Consistent with theory that antisocial personality traits are largely characterized by disinhibition, the hereditability of disinhibited behaviors and externalizing disorders are very high (Young, 2000). Research on the Externalizing Spectrum Inventory (Krueger, Markon, Patrick, Benning, & Kramer, 2007; Patrick, Kramer, Krueger, & Markon, 2013) evinces a bifactor model of externalizing. This model consists of a single general externalizing factor that all inventory facets load onto as well as independent subordinate factors for callous-aggression and substance use.

While patterns of externalizing underlie both antisocial and psychopathic behavior, boldness and fearlessness are more relevant to psychopathy over ASPD (Patrick, Hicks, Krueger, & Lang, 2005; Venables, Hall, & Patrick, 2014). Similarly, the callous-aggression subfactor of the externalizing bifactor model has been shown to be a significant point of contact between the externalizing and the interpersonal-affective deficits in psychopathy (Venables & Patrick, 2012). Pragmatically, it can be seen how disinhibited behavior of psychopathic individuals reflects a failure in ability to properly attend to inhibitory information (e.g., not thinking about harm to self or others, potential for being arrested, etc.) that is integral in signaling typical fear response. Furthermore, the impact of poor integration of inhibitory information may be augmented by deficient affective capacity in individuals high in psychopathic traits (Zeier & Newman, 2013). Thus, while disinhibition is an important component of many disorders and problematic behavior such as substance use, antisocial behavior, and psychopathy, it is not an all-encompassing explanation for psychopathic behavior. Instead, problems with disinhibition appear to set the

stage for a particular type of psychopathic presentation. Interestingly, one study even demonstrated that externalizing's role (or lack thereof) may explain some of the heterogeneity in the construct (Zeier & Newman, 2013). They found that externalizing (defined as high negative activity and low constraint) interacted with psychopathy such that individuals high in psychopathic traits and low in externalizing performed similarly to participants categorized as primary psychopaths, while those high in psychopathy but low in externalizing operated similarly to conceptualizations of secondary psychopathy (i.e., high psychopathic traits, high anxiety). This further highlights the multidimensionality of the construct. Examining specific executive functioning deficits related to disinhibited behavior, the general externalizing factor, and callous-aggression (as defined by the bifactor model of externalizing) may illuminate pathways to offending behavior specific to psychopathy.

Executive Functioning and Disinhibited Behavior

Executive functioning consists of multiple related yet distinguishable cognitive processes important to self-regulation and goal-directed behavior (Lindgren et al., 2019). Differences in executive functioning have long been linked to aggression, delinquent behavior, substance use, and general externalizing and internalizing problems (Giancola, Mezzich, & Tarter, 1998; Gustavson et al., 2017; Snyder, Miyake, & Hankin, 2015). Recent theory on executive functions suggests three primary functions: response inhibition, working memory, and set shifting (Miyake & Friedman, 2012). Vulnerabilities to externalizing are more strongly related to response inhibition than are working memory and set shifting and their acquisition is primarily genetic (Young et al., 2009). Miyake and Friedman (2012) defined inhibition as the "deliberate overriding of a dominant or prepotent responses." Thus, response inhibition plays an important role in the expression of antisocial behavior as potentially helpful responses are overridden or

ignored. The relevance of response inhibition also appears to extend to the domain of psychopathy. One theory that manages to link prevalence of response inhibition in antisocial and externalizing behavior is the response modulation hypothesis.

The Response Modulation Hypothesis and Attentional Differences

The response modulation hypothesis (RMH) attempts to explain the role of inhibition in psychopathy by suggesting that those high in psychopathic traits are less affected by the meaning of contextual cues via a processing deficit that compromises their ability to effectively accommodate peripheral cues when engaged in goal-directed behavior (Hamilton & Newman, 2018; Kosson & Harpur, 1997; Newman, Schmitt, & Voss, 1997). The RMH attributes the disinhibition common to psychopathy to an automatic direction of attention to information secondary from goal-directed behavior (Wallace, Vitale, & Newman, 1999). This theory then offers an explanation for often severe self-regulation failure and affective deficits in psychopathy. Hamilton and Newman (2018) outline four stages of the response modulation mechanism. First, an individual engages in goal-directed behavior elicited via a dominant response set or a focus on appetitive motivational stimuli. Next, following a novel or unexpected event, arousal is increased and a need for processing that demands attentional resources occurs. After this unexpected or aversive event, typical functioning individuals process this interruption and use the information to reflect upon and reevaluate the situation. However, the RMH posits that disinhibited individuals fail to switch attentional focus thus overriding potentially useful information to prospectively modulate their behavior. Finally, individuals who essentially "skip" the self-regulatory process of reflecting on the disruption consequently experience a weakened ability to form causal links to behavior. Thus, the RMH attempts to provide rationale for both the interpersonal-affective and the lifestyle-antisocial features of psychopathy. Failure to inhibit

behavior due to a diminished ability to process alternative cues results in impoverished emotional experience as affective information fall to wayside (Factor 1) while failure to evaluate potential consequences results in impulsive action (Factor 2) (Hamilton & Newman, 2018).

While the RMH integrates deficits consistent with general executive functioning impairment, much of recent research has focused on the specific role role of attention in psychopathy (Glenn & Raine, 2014; Hamilton & Newman, 2018; Hoppenbrouwers et al., 2016; Kosson & Harpur, 1997; Kosson et al., 2018; Newman et al., 2010; Sadeh & Verona, 2008). For individuals high in psychopathic traits, abnormalities in attentional allocation are consistent throughout the literature, especially when additional cues are outside of the focal spotlight. Reviews on attention in psychopathy generally conclude that these functions are significantly influenced by motivation, and attention tends to be distributed to what is of interest to the individual as additional cues fall to the wayside (Hamilton & Newman, 2018; Kosson & Harpur, 1997).

The process of facilitating early selection of goal-relevant information above other peripheral cues supports theory that psychopathic individuals are able to screen out distractions (Baskin-Sommers & Newman, 2012). This mechanism has been coined the "attention bottleneck," as a process in which there is constraint in the early stages of attention-selection and the range of information that may be processed is significantly restricted, therefore more attuned to goal directed behavior (Hamilton & Newman, 2018; Newman & Baskin-Sommers, 2012). Affective cues (and other cues in one's periphery), can be important in interpreting information about the surrounding environment and are less likely to pass through the filter of awareness, or the "bottleneck" in those high in psychopathy. This results in not only increased goal-directed attention such as that seen in Stroop and Flanker paradigms (Hiatt, Schmitt, & Newman, 2004;

Zeier, Maxwell, & Newman, 2009), but also a lower likelihood of integrating cues outside the focal spotlight. In times where emotional experience may offer a cue to regulate one's behavior (e.g., feeling anxious when standing on the edge of a tall building), emotions provide important information to integrate into decision-making that may not be made use of in those high in psychopathy. Proponents of the RMH and attention bottleneck theory then argue that instead of a flat deficiency in emotions, these useful cues that arise during the early stage of attention fail to grab the attention of those high in psychopathy. For example, the anxiety one feels while walking in a dark alley may not interfere with an individual high in psychopathic trait's goal of obtaining something of importance in the alley. Instead they appear fearless as the anxiety common to such a situation is not attended to and thus subsequent regulation following the anxiety (i.e., not going down dark alley) is not explored.

This claim that attention tends to be distributed to what is of interest to the individual as additional cues fall to the wayside has also been supported across numerous experimental paradigms and neuroimaging studies. This appears to occur more so in individuals high in psychopathy as opposed to those who are not. For example, one study found that individuals high in psychopathic traits performed similarly to controls on standard versions of the color-word Stroop task (Hiatt et al., 2004). This means that individuals both high and low in psychopathy exhibited interference, or a delayed response, that is supposed to occur when completing incongruent trials (i.e., a color word is printed in text, but the color of the font is mismatched from the semantic meaning of the word). However, individuals high in psychopathy exhibited significantly less interference when the design of the Stroop task integrated spatial or temporal separation (Hiatt et al., 2004). This was done by displaying the color and word stimuli with either gaps of time in between (showing a printed word followed shortly after by a color

block) or spatially separating the stimuli by placing the written color word in white font with a colored border surrounding it (Hiatt et al., 2004). These trials are different than a traditional Stroop task because they separate the stimuli instead of showing the color word and color of the font being in the same focal area. A lack of interference for those high in psychopathic traits in a spatial separation Stroop task suggests that when there is a broader perceptual range on the presented stimuli, they are able to focus attention on the goal of the task without being distracted by peripheral information better than those low on psychopathic traits. This is consistent with an attention bottleneck effect because the larger interference effect for individuals not high in psychopathic traits can be considered to fall within the constraint of a typical range of attention but the lack of interference in high psychopathy individuals is more indicative of constrained attention focus where the goal is to fixate on either the color meaning of the word or actual color.

Similarly, research suggests that attention moderates psychopathy's responsivity to inhibitory cues across several similar yet distinct experimental tasks of attention. This includes experimental approaches such as the Flanker task in which participants are asked to fixate on a specific point on a computer for a random amount of time until a stimulus target appears to the left or right. Following a fixation point, a stimulus is shown surrounded by "flankers" that can either be congruent or incongruent. For example, congruent trials consisted of either two letter or two number flankers (e.g., 55**G**55) while incongruent tasks contained both letter and number flankers (e.g., G5**G**5G). Participants are then asked to accurately determine the status of the central stimulus (e.g., letter, number, asterisk). The purpose of incongruent trials is to create conflict between correct and incorrect responses through increased reaction time. Attention was guided (i.e., the location of the target stimulus was highlighted) in some trials by a pseudo-random cue while in others it is not. Individuals high in psychopathy displayed significantly less

interference to those low in psychopathy when attention was cued to the target location but displayed normal interference when there was no focus of attention (Zeier et al., 2009). This finding is consistent with the response modulation hypothesis and suggests that those high in primary psychopathy were less affected by response-incongruent information when the information was peripheral to a specifically cued target location (Zeier et al., 2009). Similarly, those high in psychopathic traits demonstrated superior early-stage selective attention as indicated by greater event related potentials (P140) in an experimental task of predicting electric shocks (Baskin-Sommers, Curtin, Li, & Newman, 2012). The P140 is an electrode site measured by an electroencephalogram (EEG) that signals early attention processing. In this study, attention was shifted by adjusting the experimental task to be consistent with threat (reacting to red (potential shock) or green (no shock) letters) vs. an alternative focus of determining if letters were upper- or lower-case. P140 amplitude was larger when focus was separate from threat-prediction, indicating not only differences in early attention but also an improved ability to ignore threat related distractors when engaged in goal-directed behavior (Baskin-Sommers et al., 2012). This is further support for an attention bottleneck effect and the response modulation hypothesis.

Attention and Emotions in Psychopathy

Atypical cognitive and affective functioning appears to be relevant to the construct of psychopathy. Though affective and cognitive deficits are conceptually aligned with Factor 1 (affective-interpersonal) and Factor 2 (lifestyle-antisocial) features of psychopathy respectively, and are moderately correlated, recent literature suggests constructs historically associated with Factor 2 (e.g., emotion dysregulation, attention allocation) may also underlie the features of interpersonal-affective deficits (shallow affect, lack of empathy-remorse, grandiosity) in

psychopathy (Garofalo et al., 2018; Hare et al., 2018; Kimonis et al., 2019; Kosson et al., 2018). One likely important intersection in this regard is one's ability to attend specifically to emotions. Attention to emotion, a facet of emotional awareness, has been defined as the degree to which an individual notices, thinks about, and monitors their feelings (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Attention to emotions may have important process and developmental implications in how individuals high in psychopathic traits regulate emotions and build affective associations throughout life.

Attention to Emotions in Populations Without High Psychopathic Traits

In individuals not exhibiting traits consistent with psychopathy, emotions are believed to serve a valuable function of providing information important to perceiving situations and making evaluative judgements that can further influence our behavior (Schwarz & Clore, 1988). Failure to efficiently attend to emotional cues (i.e., attention bottleneck) or effectively regulate attention toward or away from emotional experience may then result in poor evaluative judgment and consequent behavior. One aspect of emotional attention that has been differentiated is voluntary versus involuntary attention to emotions (Huang et al., 2013). Voluntary attention to emotion is defined by making a conscious and deliberate decision to pay attention to emotions, while involuntary attention concerns having one's attention drawn to emotional experience without consciously planning to do so or despite efforts to avoid the experience. When parsed apart, involuntary attention is directly positively associated with depression and worry, directly inversely associated with acceptance of emotional experiences, and inversely associated with the type and source of emotional clarity (Boden & Thompson, 2015). In contrast, voluntary attention to emotion is positively associated with acceptance of emotional experiences, positive emotion regulation, and type and source clarity of emotions (Boden & Thompson, 2015; Huang et al.,

2013). This suggests maladaptive patterns in filtering emotional experience during the early stages of attention have important implications for consequent regulation strategies and behavior. Involuntarily and voluntarily attending to emotions may also implicate fundamental beliefs related to emotions (e.g., emotions are uncontrollable) that may be relevant to regulation (Ford & Gross, 2018).

Ford and Gross (2018) suggest that individuals tend to differ in how they think about emotions, and that beliefs about emotion are deeply consequential at each stage of emotion regulation. It is clear how beliefs such as emotions are… (bad vs. good, controllable vs. uncontrollable, useful vs. useless) may impact well-being and ability to effectively regulate emotional responses. The process model of emotion regulation (Ford & Gross, 2018; Gross, 2014) posits that emotion regulation involves several important steps: identification, selection, implementation, and monitoring. In the identification stage, an individual perceives their experienced emotion, evaluates the emotional response, and actives a goal to regulate if needed. Following this is the selection stage. This includes establishing a goal to regulate, perceiving possible strategies and evaluating their chance of success, then activating a goal to use such strategy. Finally, the implementation stage involves utilizing a specific regulation strategy and evaluating effectiveness. In between these stages, individuals are said to be in a monitoring stage in which they maintain their chosen strategy, switch to a new regulation strategy, or stop. Adaptive monitoring utilizes processing dynamics where emotional experience and an evaluation of implemented regulatory tactics (i.e., successful or not successful) are evaluated across time (Sheppes, Suri, & Gross, 2015). Disruption in this process may result in maladaptive patterns of regulation. For example, if one perceives substance use as an alluring alternative to experiencing some aversive negative state (i.e., negative reinforcement models; Baker, Piper, McCarthy,

Majeskie, & Fiore, 2004; McCarthy, Curtin, Piper, & Baker, 2010) it may be said that a maladaptive or a non-optimal choice is made in the selection stage of the process model. This potentially problematic selection strategy could then result in selection of a more immediate and external regulation strategy (e.g., drinking) as opposed to alternatives (e.g., reappraisal) that are incompatible with the individual's current situation. Another example of interference in the process of emotion regulation could be the presence of panic attacks in the identification stage (Sheppes et al., 2015). In this case, an overrepresentation of subtle signs of current emotional experience may result in identification of a threat of anxiety that cascades into a decision to regulate immediately and implement a strategy that provides temporary relief but builds longer-term maladaptive patterns. An individual may identify and evaluate emotional experience of anxiety as an oncoming anxiety attack (identification), decide that this response needs to be modulated, then selecting and implementing a strategy that is overly positively valued (e.g., not going to a place where crowds may be) despite the avoidance behavior that may be reinforced.

In the process model of emotion regulation, deficits in the ability to attend to emotions could also create a disturbance detrimental to adaptive regulation. More specifically, failure to direct attention towards or away from emotional experience may lead to various problems in the monitoring and identification stages of the model. For example, being able to efficiently attend to emotional cues is likely important in understanding one's current emotional experience or the experience of others. Difficulty attending to these emotional experiences could result in failure to initiate regulation in the first place or accurately monitor the affective outcomes of other regulation strategies. Conversely, failure to direct attention away from emotional experience could result in distraction from other goal-oriented behavior, disrupt the monitoring stage of the process model, and impede the selection stage of regulation. Indeed, when individuals perceive

their emotional experiences to be attended to involuntarily and out of their control, they are more likely to act urgently (Webb, Simons, & Walters, 2019). Difficulties modulating attention towards or away from emotional responses may also contribute to the development of negative beliefs (e.g., emotions are bad for me, emotions are uncontrollable) about emotion. Beliefs related to emotions being bad, uncontrollable, or maladaptive may result in a modulation of attention away from emotional stimuli. These beliefs have been linked to poor emotion regulation and depression (Ford et al., 2018) and may also extend to externalizing behavior. Failure to efficiently attend to emotional experience, and more specifically to modulate attention towards or away from emotional experience, may then explain attentional and affective anomalies in high psychopathy individuals.

Implications of Emotional Attention in Psychopathy

As discussed in previous sections, individuals high in psychopathy tend to exhibit significant deficits in their ability to attend to peripheral information and to respond typically to emotionally based cues. Historically, there has been some disagreement on if these deficits were specifically attentional or emotional in nature (Glenn & Raine, 2014). While some earlier work believed there to be inherent emotional deficiencies consistent with low levels of fear, affect recognition, and arousal akin to Cleckley's (1949) prototypical psychopath (Lykken, 1957), others suggested dysregulated attention (i.e., response modulation hypothesis) is responsible for the various behavioral and affective outcomes associated with the construct (Kosson & Harpur, 1997; Newman et al., 1997). However, recent literature poses an argument that psychopathy is more multifaceted and dimensional than previously believed and that attention and emotions are both distinct and important factors in explaining the development of psychopathy and offending behavior relevant to the construct (Kimonis et al., 2019; Kosson et al., 2018; Patrick, 2018a).

Indeed, individuals high in psychopathic traits have demonstrated attenuated emotional attention to negative stimuli in dot probe paradigms (Kimonis et al., 2019). That is, prioritization of negative emotional stimuli in awareness was diminished in those high in psychopathic traits on experimental measures of spatial attention capture and spatiotemporal competition. This is inconsistent with performance of individuals who do not exhibit psychopathic traits, as they tend to preferentially allocate attention to negative emotional stimuli in their environment because doing so is important in social and survival situations (Kimonis et al., 2019; Vuilleumier & Huang, 2009). These emotional attention deficits appeared to be most significant in those high in interpersonal-affective traits when impulsive and antisocial traits were also high. This highlights the complex interconnectedness of the Factor 1 and 2 features and is consistent with research that suggests emotion dysregulation underlies both aspects of the construct due to significant attentional impairments for emotional stimuli (Garofalo et al., 2018). Kosson and colleagues (2018) similarly found that as levels of affective-interpersonal traits increased in incarcerated youth high on psychopathy, attentional bias was employed away from sadness- and happiness-related stimuli. However, this effect was moderated by age such that as age increased, higher levels of the affective-interpersonal component of psychopathy were associated with increasing attentional bias away from sad and happy stimuli. This suggests the affectively based deficits core to psychopathy may develop over time and is strong support for the Negative Preception Hypothesis which states emotional deficits in psychopathy are learned over time (Kosson et al., 2018).

The Negative Preception Hypothesis suggests that those high in psychopathic traits are skilled at attenuating the intensity of noxious stimuli before the occurrence of the actual event. Kosson and colleagues (2018) elaborated on this by suggesting that psychopathic individuals not

only are able to attenuate the impact of external stimulation (as demonstrated in skin conductance and startle response paradigms) but also a wide breadth of aversive internal negative emotional experience such as sadness and anxiety. Thus, youth learn to effectively tune out negative emotional experience as an active coping process. In turn, this process yields short term relief and is automatized via negative reinforcement that ultimately results in a blunted and impoverished emotional life. This theory clarifies inconsistencies in the literature stating that negative emotionality is positively correlated with psychopathy during adolescence but this relationship somehow diminishes over time (Kosson et al., 2018; Kubak & Salekin, 2009) and findings that some emotion recognition deficits improve if time viewing the stimuli is increased (Lemos Vasconcellos, Salvador-Silva, Gauer, & Chittó Gauer, 2014).

The process of attenuating the impact of negative emotions via an automatic modulating of attention away from them is also relevant to the process model of emotion regulation, and more specifically the identification stage of regulation. In the case of psychopathy, individuals may automatically divert attention away from emotional experience in situations where emotional cues may be important to interacting with others or identifying one's own emotions. Failure to attend to emotional experience may then disrupt the identification stage, failing to "kick start" a consequent appropriate emotion regulation strategy. If this process occurs alongside a compromised executive functioning system that is prominent in many antisocial and impulsive individuals, the stage may be set for primary psychopathy to foster a blunted and impoverished emotional life.

Summary and Proposed Model

Psychopathy exacts a large toll on society and the criminal justice system. Contemporary models of psychopathy describe a dimensional and multifaceted construct of both deficient

affective processing (i.e., shallow affect, lack of empathy, fearlessness, etc.) as well disinhibited and impulsive behavior. The interpersonal-affective dimension is believed to be underpinned by diminished general responsiveness to emotions while the antisocial-lifestyle dimension is related to compromised executive functioning and severe disinhibition. Underlying these features of psychopathy are problems specific to response inhibition and attention. However, there is debate whether the presentation of psychopathic traits is more strongly related to attentional deficits or if there are atypical processing differences specific to emotional processing and regulation. Individuals high in psychopathic traits demonstrate attention abnormalities in the early stages of attention filtering, especially when external information (including affectively neutral) is secondary to goal-motivated attention (Kosson et al., 2018). However, there are discrepancies in emotion recognition for discrete emotional states as well as the strength of these relationships between studies. Thus, ability to attend to emotional experience and regulate attention towards or away from emotional cues (especially negatively valences cues) may be particularly difficult for those high in psychopathic traits and a mechanism underlying both Factor 1 and 2 features. This would be consistent with the Negative Preception Hypothesis that states that individuals learn in childhood and adolescence to direct attention away from aversive emotional states, and that this coping mechanism becomes automatized over time (Kosson et al., 2018).

This difficulty in modulating attention to emotions would address inconsistencies in attentional studies as well as differences in affective processing across discrete emotional states (e.g. fear vs. happiness). An inability to tune into these experiences likely disproportionately effects negative emotions over positive ones and also shapes attentional processing to a degree. That is, a history of modulating attention away from various negative emotions and aversive stimuli is likely to result in a poor ability to exercise this skill in cases where attending to such

situations may be useful. Furthermore, the Negative Preception Hypothesis suggests that that attentional anomalies not only exist in high psychopathy individuals, but that attention towards emotions may be neglected or avoided starting from an early age. If true, the automaticity of this process for coping will be evident even when tuning into emotional stimuli is a primary goal. Negative experiences in childhood also likely contribute to negative fundamental beliefs about emotion, further resulting in a disturbance in identifying emotions and employing effective regulation strategies. A deficit in one's ability to modulate attention towards emotional experience may result in a failure to engage in adaptive regulation and result in poor emotional development as affect – consequence relationships are not formulated. Conversely, difficulties tuning out emotional experience may result in distraction and urgent behavior consistent with Factor 2, secondary psychopathy, and a broader range of emotion dysregulation problems.

The current study aimed to understand the role of emotional attention in the core features of psychopathy. The ability to modulate attention toward or away from emotional experience may be an important deficit in those high in psychopathic traits. An experimental task of emotional attention regulation (EAR) ability (Elfenbein, Jang, Sharma, & Sanchez-Burks, 2017) was used to examine two aspects of this ability: tuning into nonverbal emotional cues (TINC) and tuning out nonverbal cues (TONC). Poor performance (i.e., higher error rate on incompatible trials) on a task of tuning into nonverbal emotional cues is believed to tap into poor emotion recognition when under distracting visual conditions. This is conceptually similar to constructs related to poor emotion recognition such as alexithymia and poor emotional clarity, as tuning into nonverbal cues requires participants to identify or describe a particular emotion with additional distractor stimuli present (Boden & Berenbaum, 2011; Parker, Taylor, & Bagby, 2001). Conversely, poor performance on a task of tuning out nonverbal emotional cues is

believed to represent a deficit in the ability to regulate attention when distracted by nonverbal emotional stimuli. This task is conceptually similar to the construct of involuntary attention to emotion, in which emotional experience is perceived as intrusive and disruptive (Huang et al., 2013). To this degree, disruptive emotional cues were expected to facilitate urgency and rash action consistent with disinhibited behavior and externalizing related to Factor 2 of psychopathy.

Poor performance (i.e., number of errors) on both TINC and TONC was hypothesized to be positively associated with total PCL:SV scores above and beyond the effect of age, intellectual capacity, and education level. Poor performance on the TINC task was hypothesized to be positively associated with Factor 1 and Factor 2 scores above and beyond the effect of age, intellectual capacity, education level, and the variance accounted for by the other factor. Conversely, poor performance on the TONC task was hypothesized to be positively associated with Factor 2, but not Factor 1 scores, above and beyond the effect of age, intellectual capacity, education level, and the variance accounted for by Factor 1.The current study also aimed to examine differential effects across the specific emotional stimuli in the experimental task. Difficulties tuning in and out nonverbal cues for trials in which fear is the primary target (TINC) or distractor (TONC) are hypothesized to have a stronger effect than those for sadness and happiness (Brook et al., 2013).

Method

Participants

Participants ($N = 60$) were all incarcerated individuals who identified as male. Location of the participants at the time of participation ranged from medium (27.7%), high-medium (32.3%), and maximum (40%) security prisons within the same midwestern state. Number of prior felonies in the sample ranged from 1 to 13 ($M = 3.93$, $SD = 2.54$, $Mdn = 4$). The period of

time spent in incarceration in the sample ranged from 435 days to 8940 days (M = 2770.01, SD = 1994.3, Mdn = 2220.5). Participants were primarily Native American or Alaskan Native (50%, White 29%, multiracial 8%, Black 6%, Other 6%). 51% of the sample reported a past diagnosis of ADD or ADHD. All participants were previously assessed by the prison's Risk Reduction Program. This means that prior to contact from the researcher they were referred to the program due to a high amount of risk factors for future recidivism. A referral to the Risk Reduction Program is made when inmates surpass a threshold on various intake assessments (e.g., above 37 on the Level of Services Inventory, a measure which evaluates static risk factors of incoming inmates) or are referred due to the nature of their offense (e.g., a particularly violent assault or remarkable use of instrumental violence in the inmate's index offense). As part of the risk reduction process, participants are interviewed and a PCL:SV is completed. All participants had a previously completed PCL:SV score ranging from 9 to 22. Exclusion criteria for participation included ages below 18 or above 50, intellectual capacity assessed in the initial meeting at below 70 IQ (via Shipley Institute of Living Scale – 2nd Edition), or color blindness.

Procedure

All measures and experimental tasks were reviewed and approved by the university institutional review board and the prison's review board for research projects. Participants were contacted through the prison communication system and the opportunity to participate in the research study was presented. Before participating, the researcher covered the nature of the study and the consent process. During this time, participants were briefed on the voluntary nature of the study, the financial compensation for participation, and the independent nature of the study from any future parole or sentencing decisions. Upon agreeing to participate with the study, each participant met with researchers twice. The first meeting covered confidentiality, consent, and

the independence of the study from DOC proceedings, as well as completion of a brief intelligence assessment and other initial baseline measures. The first meeting on average took approximately an hour. The second meeting consisted of explaining and completing the laboratory-based task. The EAR laboratory task takes approximately 45 minutes. All measures and experimental tasks were completed in a secure and private location on a computer. Participants received $5 per day resulting in $10 for full completion of the study.

Measures

Data Collection Strategy

Data was collected via review of participant Department of Corrections chart information, completion of in-person questionnaires, a brief intellectual assessment, and an experimental task. Data including PCL:SV scores, time until parole, index offense, felonies in state, years spent in prison, mental health diagnoses, and substance use history were obtained from prison records. Collection of DOC records occured through the online records program used by the state prison. Information was queried from the system with PCL:SV scores and relevant demographics being reported for each participant. PCL:SV information was scored prior to data collection as part of the Risk Reduction Program and was also obtained through the process of chart review. The experimental (EAR) task, brief intelligence assessment, and self-report questionnaires were completed in-person under the supervision of the researcher or trained research assistant.

Demographics. Baseline demographics collected included race, age, education history, years spent in prison (current and total), history of color blindness, index offense, prior felonies in state, and time until parole, prior mental health diagnoses, and substance use history. Time until parole, index offense, felonies in state, years spent in prison, mental health diagnoses, and

substance use history was obtained from prison records. History of ADHD was also be collected via a single demographic item, “Have you ever been formally diagnosed with ADHD, ADD, or another attention disorder?” and through record review through the DOC online system. This will allow for a broader indication of attention disorder as there are inconsistencies in the reporting of ADHD and ADD in the prison record system. Any participant that either endorses the demographic item or has a documented diagnosis indicated by their prison record was coded as having an attention disorder diagnosis.

Psychopathy. Psychopathy was assessed through the Psychopathy Checklist Screening Version (PCL:SV; Hart, Cox, & Hare, 1995). This measure is a slightly shorter derivative of the Psychopathy Checklist: Revised (Hare, 2003) commonly used as a stand-alone research instrument for forensic populations (Hare et al., 2018). The PCL:SV is a 12 item measure of psychopathy, utilizing the same 2 factor structure of the PCL:R. All items are scored on a 3-point (0, 1, 2) scale indicating the presence of a particular criterion. A score of 0 suggests no presence of an item, while a score of 1 or 2 indicates some evidence or clear presence of each trait respectively. Factor 1 includes 6 items pertaining to interpersonal-affective features of psychopathy: glibness/superficial charm, grandiosity, manipulativeness, lacks remorse, lacks empathy, and failure to accept responsibility. Factor 2 includes 6 items pertaining to social deviancy (i.e. antisocial/lifestyle features) and includes impulsivity, poor behavioral controls, irresponsibility, lack of long-term goals, adolescent antisocial behavior, and adult antisocial behavior. Items are scored by qualified raters. A cutoff score of 18 has been identified to be a useful cutoff for detecting the presence of psychopathic traits (Hare et al., 2018). In the current study, all PCL:SV’s were scored by a PCL:R certified supervising psychologist and a senior doctoral level graduate student. Completion of the assessment generally involves an interview

typically ranging from 1.5 to 2 hours and a complete file review, though only file review has been shown to be an adequate alternative (Guy & Douglas, 2006). The PCL:SV has been shown to be related to the PCL:R conceptually, psychometrically, and empirically (Guy & Douglas, 2006; Hare et al., 2018; Higgs, Tully, & Browne, 2018). For example, the correlation between the PCL-R and PCL:SV in correctional samples is .94. Similarly, correlations on factor scores are also high with Factor 1 at .96 and Factor 2 at .94. The PCL:SV also shares similar but not perfect classification accuracy regarding PCL categories (e.g. low, moderate, high). This measure has shown good reliability and validity in forensic samples between raters (Higgs et al., 2018). PCL:SV interviews and scoring are conducted prior to the current study by the risk reduction program and are only being obtained for research use following DOC approval. Scores for PCL:SV total, Factor 1 score, and Factor 2 score were used as the primary outcome variables of the study.

Intellectual Functioning. The Shipley Institute of Living (Zachary, 1986) brief intelligence assessment was completed during the first meeting. The Shipley-2 is a brief screening tool for cognitive functioning and is widely used to assess cognitive ability and impairment. The Shipley-2 has been used in studies of incarcerated individuals, and has shown to be an adequate and efficient method of assessing intellectual functioning for tasks of attention (Sadeh & Verona, 2008; Vitale, Kosson, Resch, & Newman, 2018; Zeier & Newman, 2013). Scorers above 70 on the assessment were included in the current study, and intelligence as assessed by the Shipley-2 were included in analyses as a covariate.

Emotional Attention Regulation. Ability to regulate attention towards or away from various emotional cues was measured via the emotional attentional regulation task validated by Elfenbein, Jang, Sharma, & Sanchez-Burks (2017). Participants complete eight trials in which

they tune in to or tune out emotional cues while processing either visual or auditory information. Error rates and reaction times for each trial were recorded. Percentage of correct scores over trials were the primary method of scoring for the current study. This objective emotional attention regulation (EAR) task has been shown to demonstrate sufficient divergent validity from personality traits (i.e., agreeableness, openness to experience, etc.), as well as strong test-retest reliability (Elfenbein et al., 2017). One-week test-retest reliability was substantial for error rates in the EAR task (average $r = 0.62$). This test-retest reliability was comparable to another performance based measure of affect recognition, the Diagnostic Analysis of Nonverbal communication of affect (Elfenbein et al., 2017; Nowicki & Duke, 1994). The task has also demonstrated convergence and divergence on theoretically relevant criteria such as other measures of emotional intelligence and emotion recognition. For example, the TINC has been shown to have positive relationships with tasks of emotional identification of faces, emotional intelligence measures of understanding emotions, extraversion, agreeableness, openness to experience, and an inverse relationship with neuroticism. Conversely, TONC performance has demonstrated positive associations with neuroticism and anxiety (Elfenbein et al., 2017).

The modified EAR task from Elfenbein and colleagues (2017) consists of eight blocks: four visual and four auditory (see Table 1). The original task consisted of happy and sad emotional cues. The current study intends to add fearful emotional stimuli. Each block of the TINC and TONC tasks includes 20 sample items with corrective feedback and 55 trials. The entire EAR task (TINC and TONC) takes approximately 45 minutes for participants to complete. The auditory test consists of 11 positive and 11 negative words, with equal number of trials in each condition of vocal tone (happy, sad, fearful). Every word was recorded and played back in the EAR task with positive and negative vocal tones. This allows for randomization of words

with positive (happy) and negative (sad) vocal expression and positive (e.g., joyful) and negative (e.g., evil) semantic meaning that comprise compatible (e.g., congruent positive tone and positive semantic meaning) and incompatible trials (i.e., incongruent positive tone and negative semantic meaning). Similarly, the visual task consists of 14 green and 14 red colors on happy, angry, and fearful expressions. These instructions are consistent with Elfenbein, Jang, Sharma, & Sanchez's (2017) validated objective approach of measuring EAR.

In the visual task, participants are asked to push a corresponding button on a keyboard according to a visual stimulus that features an image of a face that is either red or green tinted. Participants are instructed to either tune in or tune out of emotionally based nonverbal stimuli. In the visual tasks, participants may be asked to tune into nonverbal cues (TINC) by pushing J for welcoming, or "happy" faces, and pushing F for unwelcoming, stop, or "angry" faces. This is done independent of color traditionally associated with "stopping" (red) and "going" (green). Conversely, tuning out nonverbal cues (TONC) requires participants to modulate attention towards the meaning of a stimuli while ignoring the affective component accompanying each trial. An example of an incompatible trial for the visual TONC task would be pressing the correct key (press F for red) when the image displays a red tinted happy face.

In the auditory task, participants are asked to determine the valence of a word depending on the way it is spoken or the semantic meaning of the word. Participants are instructed to either tune in or tune out of emotionally based nonverbal stimuli. TINC auditory trial instructs participants to respond to the verbal tone of the word despite the semantic meaning. In this case, participants must select one option (press J) for sad tone and another (press F) for a happy tone. An example of an incongruent trial would be the word "funeral" being read in a happy tone, requiring the participant to attend to the cheerful verbal tone and pressing F even though word

funeral has a negative semantic meaning. The auditory TONC task requires participants to attend to the semantic meaning of the word while distracting emotional information (i.e., vocal tone) is present. Tuning out emotional nonverbal cues requires participants to modulate attention away from emotional cues and attend to the discrete and literal stimulus. An example of an incompatible trial for the auditory TONC task would be to select the positive (press J) command when the word "joyful" is read in a sad tone.

Tasks incorporating the fear stimuli were the same as Elfenbein & colleague's (2017) task except for replacing sad stimuli for fear stimuli. This allows for similar trials in which negative and positive emotions are present in each task but the form of the negative emotion (sadness or fear) changes. In all trials, participants are asked to make their responses as quickly and as accurately as they can. Scores were calculated as error rates for incompatible trials. The tuning into nonverbal cues (TINC) performance score were the percentage correct for all incompatible TINC blocks (visual TINC sad – happy, visual TINC fear – happy, auditory TINC sad – happy, auditory TINC fear – happy). The tuning out nonverbal cues (TONC) performance score was the percentage correct for all TONC blocks (visual TONC sad – happy, visual TONC fear – happy, auditory TONC sad – happy, auditory TONC fear – happy). Additionally, variables were calculated for tuning into and out fear, happiness, and sadness. These scores were created by examining the error rate of the specific emotion on trials where the specific emotion was the target stimulus. For example, a tuning in fear variable was created by all errors on trials in which tuning into fear (i.e., faces portraying fear or fearful vocal expression) is required (visual TINC **fear** - happy, auditory TINC **fear** - happy). Conversely, a tuning out fear variable was created as the error rate of trials in which tuning into other target stimuli while fear was a distractor stimuli

(visual TONC **fear** - happy, auditory TONC **fear** - happy. This was done for all three emotional states in the study.

Additional Measures Collected During Baseline

Psychopathy (Triarchic Conceptualization). An additional measure of psychopathy was collected via self-report to examine alternative models and evaluate the validity of the PCL:SV measure. The Triarchic Psychopathy Measure (TriPM) was developed to operationalize psychopathy consistent with Patrick, Fowles, and Krueger's (2009) three separate categories related to the construct. The TriPM is a 58-item measure in which participants respond with either *True, Somewhat True, Somewhat False,* and *False.* The items compose three constructs related to psychopathy, a 19-item boldness subscale, a 20-item disinhibition subscale, and a 20-item meanness subscale. The TriPM has shown strong internal consistency (α = .80 - .87) , good test-retest reliability (r = .64 - .77 over 3-month period), and divergent / convergent validity against constructs of various personality functioning measures such as the NEO-FFI subscales and the Weinberger Adjustment Inventory (Blagov, Patrick, Oost, Goodman, & Pugh, 2016).

Positive and Negative Affect. Positive and negative affect were assessed through the Positive and Negative Affective Scale (PANAS; Watson, Clark, & Tellegen, 1988). This measure consists of 10 positive (e.g., inspired) and 10 negative (e.g., guilty) adjectives that participants rate on a 1 (not at all) to 5 (extremely) scale. The measure was framed to assess participant's general affect. The scale has been shown to have strong internal consistency (positive affect α = .88, negative affect α = .87; Watson, Clark, & Tellegen, 1988). The PANAS will be used for future exploratory analyses.

Voluntary and Involuntary Attention to Emotion. Self-report attention to emotion was assessed using the 15 items recommended by Huang, Berenbaum, & Chow (2013). Seven items

measure involuntary attention to emotion, and consist of questions such as "I unintentionally think about my feelings," and "I automatically evaluate my mood," (α = .84). Similarly, voluntary attention to emotion was measured through 8 items, consisting of questions such as, "I think about and try to understand my emotional reactions," and "I find examination of my feelings useful in solving personal problems," (α = .84). Participants answer questions on a 5-point scale, with higher scores representing higher voluntary or involuntary attention to emotion. The involuntary attention to emotion and voluntary attention to emotion scales were used to assess the validity of the primary experimental EAR task and for future exploratory analyses.

Difficulties in Emotion Regulation. Emotion dysregulation was assessed using the 36 items of the Difficulties in emotion regulation scale (DERS, Gratz & Roemer, 2004). Participants respond to items on a 5-point Likert scale with items corresponding to six interrelated dimensions: nonacceptance of emotional responses (nonacceptance), difficulties engaging in goal-directed behavior (goals), impulse control difficulties (impulse), lack of emotional awareness (awareness), limited access to emotion regulation strategies (strategies), and lack of emotional clarity (clarity). The internal consistency for each subscale has been shown to be adequate, with the subscales αs ranging from .80 to .89 (Gratz & Roemer, 2004). The DERS will be used for future exploratory analyses.

Anxiety. Anxiety was assessed using the Manifest Anxiety Scale (TMAS, Taylor, 1953). The TMAS consists of 38 items that participants respond either "True" or "False" to. Example items are, "I find it hard to keep my mind on a task or job," and, "I worry quite a bit over possible misfortune." A version of the TMAS revised for juvenile participants has been used to differentiate primary and secondary psychopathy in adolescents (Kimonis et al., 2012). The TMAS will be used for future exploratory analyses.

Planned Analyses

Power analysis

An a priori power analysis was performed in G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009), with power of .80 and alpha of .05. Previous research on emotion processing and psychopathy indicates effect sizes that differ across specific emotions but range from d = -.33 for happiness to d = -.56 for negative emotions such as fear and disgust (Brook et al., 2013). Research on emotion dysregulation and psychopathy also suggests medium effect sizes (partial eta^2 = .05 - .08) in group differences for high vs. low difficulty regulating emotions (as indicated by the DERS) in predicting psychopathy (Garofalo et al., 2018). An effect size of f^2 = .15 is generally considered a medium effect (Cohen, 1988). Hence, sample size was estimated to provide sufficient power to detect a specific effect of f^2 = .15 in a regression model with 5 predictors. The analysis indicated power of .80 with a sample of 55 participants. Hence, the target N of 60 allows for up to 8% missing cases or slightly smaller effects of f^2 = .14 to be adequately powered. This sample size is consistent with some other experimental studies of psychopathy (Hoppenbrouwers et al., 2016; Lemos Vasconcellos et al., 2014; Levenston, Patrick, Bradley, & Lang, 2000).

Data Cleaning and Variable Scoring Plan

Upon completion of data collection, data was examined to identify potential outliers and careless responding. In order to detect careless responding on the baseline questionnaire, structured response items such as “For this question, select strongly agree,” was used at a rate of approximately 1 for every 50 items (Meade & Craig, 2012). Experimental EAR task data was then aggregated into variables for tuning into nonverbal cues (TINC) and tuning out nonverbal cues (TONC) for total performance (all emotional cues), happiness, sadness, and fear. Thus, 2

total score predictors (visual + auditory TINC, visual + auditory TONC) and 6 emotion specific predictors (visual + auditory TINC (anger, sadness fear), visual + auditory TONC (anger, sadness, fear) was created for analyses. Self-report voluntary and involuntary attention scores (Huang et al., 2013) were also calculated in order to assess divergent and convergent validity of the EAR task.

Analytical Plan

In order to test hypotheses that the ability to regulate attention towards or away from emotions independently predict features of psychopathy (Factor 1(interpersonal and affective) and Factor 2 (lifestyle and antisociality)), several regression models were estimated in Stata 14 (StataCorp, 2015). To test the hypothesis that TINC predicts Factor 1 scores, a regression model was estimated with Factor 1 as a continuous outcome. A model building approach was used. In Step 1, the Factor 1 scores were regressed on associated covariates of age, education level, and intelligence. In Step 2, TINC scores were introduced into the model. In Step 3, Factor 2 scores were included in the analyses to account for the variance of the opposing factor of psychopathy and determine if the effect of TINC is significant over and above the effect of the other factor. The effect size f^2 for TINC at Step 2 was calculated to determine the effect of TINC on Factor 1 scores over and above the effect of age, education level, and intelligence. The effect size f^2 for TINC at Step 3 was calculated to show the effect of TINC on Factor 1 scores over and above the effect of Factor 2 scores, age, education level, and intelligence. A significant effect of TINC in the full model would support the hypothesis that difficulty modulating attention toward emotional cues is a significant predictor of interpersonal and affective deficits in psychopathy. These steps were repeated in another regression analyses in which Factor 2 was regressed on age, education, intellectual capacity, TINC, and Factor 1. A significant effect of TINC in this analysis

would support hypotheses that difficulty directing attention towards emotional experience is a significant predictor of the social deviancy (Factor 2) aspect of psychopathy. To test the hypothesis that ability to tune out non-verbal emotional cues is positively associated with the lifestyle and antisocial (Factor 2) aspect of psychopathy, these two regression analyses were also conducted with TONC scores as a predictor instead of TINC scores. TONC performance was expected to predict Factor 2 but not Factor 1 scores. This would suggest that difficulty regulating attention away from distracting emotions in the presence of alternative goal-oriented tasks contributed to the dysregulation frequently attributed to Factor 2 of psychopathy.

Two regression models were also estimated to test the hypotheses that TINC and TONC are associated with total score on PCL:SV. In the first analysis, total PCL:SV scores were regressed on age, intelligence, and education level. Next, TINC score were included in the model. A significant effect of TINC in this model would support hypotheses that difficulty modulating attention towards emotional cues is a significant predictor in psychopathy. A similar model was estimated in which TONC is the predictor of interest.

To test hypotheses that the inability to effectively regulate attention toward or away from fear stimuli would have a stronger predictive effect than performance on stimuli of sadness and happiness, a regression model was estimated with total PCL:SV scores as a continuous outcome. In Step 1, all covariates (age, education level, and intelligence) were included in the model. Next, TINC scores for specific emotional states (sadness, happiness, fearfulness) were added to the model. The fear coefficient is expected to be a significant predictor of PCL:SV total scores, over and above sadness and happiness. This would support the hypothesis that individuals higher in psychopathic traits would display a more difficult time tuning into fear specific non-verbal

emotional cues as opposed to other emotions. A similar model in which TONC scores for specific emotions is a predictor instead of TINC scores was also estimated.

Exploratory Analyses

Exploratory analyses were conducted to assess the predictive ability of TONC and TINC performance on an alternative model of psychopathy, the triarchic psychopathy measure (Patrick et al., 2009). A series of regression analyses were conducted for each scale of the TriPM (boldness, meanness, and disinhibition) in which either TINC or TONC performance were included as predictors alongside covariates of age, education, and intellectual capacity. These exploratory analyses allow the performance across TINC and TONC to be examined in the context of an alternative self-report assessment of psychopathy that capture differing components of the construct.

Results

Data Cleaning

Data was examined to identify potential outliers and careless or random responding. Error rates and difference in reaction time between congruent and incongruent trials were calculated for each participant (Elfenbein et al., 2017). Consistent with Elfenbein et al., participants with error rates exceeding 30% throughout all trials were considered for exclusion in the final analyses. However, no participants in the current sample exceeded this threshold, thus all participants were included in the final sample. Reaction times in the TINC and TONC experimental tasks were also assessed for abnormal response times. Trials in which response time exceeded 5 seconds were considered a time error and were thus excluded from the aggregate percentage error rate and reaction time variables. A total of 173 trials were excluded

from the dataset for this time error (0.58% of all trials). 5 participants were excluded from the analytical sample due to intellectual functioning scores on the Shipley-2 that were below 70.

Descriptive Statistics

See Table 2 for univariate statistics and Table 3 for the correlation matrix. 51% of the sample reported a past diagnosis of ADD or ADHD. The sample was relatively diverse in PCL:SV scores, with 26 participants (43%) below and 34 participants above the research-based cutoff for determining the clear presence of psychopathic traits (Hart, Cox, & Hare, 1995).

Both TINC and TONC scores suggest relatively strong performance across both tuning into- and tuning out tasks. As expected, mean performance was higher in a task of tuning out non-verbal emotional cues (attending to the color / semantic meaning of word) than a task of regulating attention toward non-verbal emotional cues indicated by facial expression or vocal tone. Furthermore, participants appeared to perform more consistently in the visual ($M = 0.96$, $SD = 0.06$) as opposed to auditory ($M = 0.79$, $SD = 0.20$) trials. This is consistent with literature that suggests audible affective processing is notably pronounced in individuals high in psychopathy (Bagley, Abramowitz, & Kosson, 2009). TONC and TINC were also moderately positively associated with each other. This is consistent with the validation study in which TONC and TONC demonstrated moderate to strong associations across validation samples (Elfenbein et al., 2017). Thus, participants in the current study tended to perform similarly TINC and TONC variables exhibited a significant ceiling effect and were heavily negatively skewed. Alternative methods of assessing TINC and TONC ability were examined (i.e., reaction time difference between congruent and incongruent trials) but yielded similar results to the error rate that was used in the initial analyses. The relatively high TINC and TONC performance variables

for the sample suggest that the ability to modulate attention toward or away from emotional non-verbal cues is likely not a widespread deficit throughout the correctional population.

Intellectual functioning in the sample exhibited a moderate positive correlation with performance on both the tuning into and tuning out nonverbal cues on the EAR task. This is consistent with previous literature suggesting a convergence between crystallized cognitive intelligence and emotional intelligence that likely applies to one's ability to effectively regulate their attention towards or away from emotional cues (Côté, 2015; Elfenbein et al., 2017). There were no significant correlations between self-report involuntary attention to emotion and TINC / TONC performance. However, self-report voluntary attention to emotion (Huang et al., 2013) was moderately negatively associated with TINC and TONC. While this pattern is somewhat counterintuitive, it may suggest that the ability to tune in and tune out emotions is inversely associated with perceived efforts to monitor and understand feeling states. Of note, the TINC and TONC variables exhibited a significant ceiling effect and were heavily negatively skewed. Alternative methods of assessing TINC and TONC ability were examined (i.e., reaction time difference between congruent and incongruent trials) but yielded similar results to the error rate that was used in the initial analyses.

In contrast to previous research, there was no significant correlation between Factor 1 and Factor 2 of the PCL:SV. Historically, these factors exhibit a moderate correlation (Douglas, Yeomans, & Boer, 2005; Guy & Douglas, 2006; Hare, 2016). This may be due to the constrained Factor 2 representation in the current sample. That is, due to the nature of the sample (individuals selected from a high-risk pool of individuals referred for a violence-risk evaluation), it is likely the Factor 2 scores are inflated due to the various static factors (e.g., juvenile criminal record, criminal versatility, substance use history, poor adherence while on conditional release, etc.) that

would facilitate a referral for an evaluation. In the current study, PCL:SV scores did not demonstrate expected positive associations with other variables that are generally supported throughout research. For example, in this sample there were no significant associations between the Factor 1, Factor 2, or total PCL:SV scores that are generally found to be moderately correlated (Guy & Douglas, 2006; Hare, 2003; Hare et al., 2000; Hare et al., 2018). Similarly, there were no significant associations between the PCL:SV and number of felonies in the current sample. This is also inconsistent with literature that suggests individuals high in traits consistent with psychopathy are more likely to violently and non-violently recidivate and commit more offenses (Anderson et al., 2018; Hare & Neumann, 2009; Olver & Wong, 2015). Indeed, both the interpersonal and affective facets of psychopathy as well as the antisocial and lifestyle facets appear to be relevant variables in commission of additional felonies and recidivating both violently and non-violently (Aharoni et al., 2013; Anderson et al., 2018; Hare, 2016; Olver & Wong, 2015). The sample's PCL:SV scores also demonstrated unexpected null or negative associations with an alternative / exploratory method of psychopathic trait assessment conducted during the procedures (Triarchic Psychopathy Measure, TriPM). The TriPM (Patrick et al., 2009) that conceptualizes psychopathy into three separate scales (boldness, meanness, disinhibition). The meanness and disinhibition scales have been found to moderately to strongly correlate with the PCL:R Factor 2 (Yoon, Mokros, Rettenberger, Briken, & Brunner, 2021). In the current sample, the relationship between PCL:SV factors and TriPM scales were modest and negative. As such, the lack of expected correlations commonly seen in the literature suggests potential validity concerns for the PCL:SV in the study sample. This may warrant alternative approaches for conceptualizing and assessing psychopathy to test the hypothesized effects of tuning into and out nonverbal emotional cues.

Exploratory Model of Psychopathy

As the PCL:SV indicated some potential validity concerns in the current sample, an alternative model of conceptualizing psychopathy (TriPM) collected during procedures was assessed as an alternative outcome measure of psychopathic traits. The scales of the TriPM each exhibited weak to moderate, primarily non-significant, relationships with the TINC and TONC variables (see Table 4 and 5). Boldness showed a moderate positive correlation with TINC performance on visual emotion-specific stimuli. This correlation was strongest with happiness, but also significant for fear and sadness. Conversely, meanness demonstrated an inverse association with performance on tuning out non-verbal emotional cues. Disinhibition showed a moderate inverse association with education. However, neither the total TriPM score nor any of the subscales exhibited a significant correlation with age or intellectual capacity.

Primary Regression Analyses

To test hypotheses that the ability to regulate attention towards and away from emotions are associated with features of psychopathy (Factor 1 and Factor 2), several regression models (see Table 4 & 5) were estimated in Stata 14 (StataCorp, 2015).

Psychopathy and Tuning In / Tuning Out Emotional Stimuli

To test the hypothesis that TINC predicts Factor 1 scores, a regression model was estimated with Factor 1 as a continuous outcome. A model building approach was used. In Step 1, Factor 1 (interpersonal and affective) was regressed on age, education level, and intelligence ($F(3, 56) = 0.81$, $p = 0.50$, $R^2 = 0.04$). In Step 2, TINC scores were introduced into the model ($F(1, 55) = 0.14$, $p = 0.71$, $\Delta R^2 = 0.004$). In Step 3, Factor 2 scores were added to the analysis to account for variance of the opposing factor of psychopathy ($F(1, 54) = 0.82$, $p = 0.37$, $\Delta R^2 =$

0.014). In the full model the effect of TINC as measured through the EAR task was not a significant predictor of Factor 1 scores ($F(5, 54) = 0.67$, $p = 0.67$, $R^2 = 0.06$).

This process was repeated for the Factor 2 outcome, with scores regressed on age, education level, and intellectual functioning ($F(3, 56) = 0.57$, $p = 0.64$, $R^2 = 0.03$). TINC were then included in the model ($F(1, 55) = 0.28$, $p = 0.60$, $\Delta R^2 = 0.005$). Finally, Factor 1 scores were added to the model to account for any additional variance the opposing factor of psychopathy may contribute ($F(1, 54) = 0.82$, $p = 0.37$, $\Delta R^2 = 0.083$). Similar to the model predicting Factor 1 scores, TINC was not associated with Factor 2 scores in the full model ($F(5, 54) = 0.55$, $p = 0.74$, $R^2 = 0.05$.

A similar model building approach was used to assess for the effect of TONC on Factor 1 and Factor 2 scores (see Table 5). The ability to effectively regulate attention away from non-verbal stimuli (TONC) showed no effect in predicting either Factor 1 or Factor 2 scores. Another pair of models in which total PCL:SV scores were regressed on TINC and TONC scores were also estimated with age, education, and intellectual functioning included as covariates. In both models, the effects of TINC ($\beta = -0.08$, $p = 0.60$) and TONC ($\beta = 0.08$, $p = 0.62$) were insignificant (see Table 4 and 5).

Differentiation of Discrete Emotion States and Psychopathy

A regression model in which TONC / TINC performance was hypothesized to predict total PCL:SV scores was also estimated. PCL:SV total scores were regressed on age, education, intellectual functioning, and TINC variables for happiness, sadness, and fear ($F(6, 53) = 0.44$, $p = 0.85$, $R^2 = 0.05$). TINC scores for happiness ($\beta = -0.002$, $p = 0.99$), sadness ($\beta = -0.25$, $p = 0.28$), and fear ($\beta = 0.12$, $p = 0.53$) were all insignificant. A similar model was estimated for the TONC variables ($F(6, 53) = 0.26$, $p = 0.95$, $R^2 = 0.03$). The specific emotion TONC variables

((happiness (β = 0.20, p = 0.70), sadness (β = -0.11, p = 0.83), fear (β = -0.14, p = 0.5)) were also all insignificant.

Exploratory Regression Analyses

Given the concerns regarding the validity of the PCL:SV, a series of exploratory analyses were conducted with an alternative measure of psychopathy to assess associations of TINC and TONC. For these exploratory analyses, the Triarchic Psychopathy Measure (Patrick et al., 2009) was used in place of the PCL:SV scores. A series of regression analyses were estimated for each of the three subscales of the TriPM (boldness, meanness, disinhibition). TONC and TINC variables were included in the analyses predicting the respective TriPM scale (see Table 6). The other two scales of the TriPM were included as covariates in the analyses to determine if the effect of TINC or TONC was significant over and above the effects of other subscales of the measure.

To test if TINC was associated with disinhibition as defined by the TriPM, the disinhibition score was regressed on age, education level, intelligence, meanness, boldness, and TINC ($F(6, 53) = 4.34$, $p < .001$, $R^2 = 0.33$). TINC was not a significant predictor of disinhibition. A similar model was estimated with TONC scores in the model ($F(6, 53) = 4.40$, $p < .001$, $R^2 = 0.33$). In this model, TONC was not found to be a significant predictor of disinhibition.

Next, a model was estimated in which meanness scores were regressed on age, education level, intelligence, boldness, inhibition, and TINC ($F(6, 53) = 7.13$, $p < .001$, $R^2 = 0.45$). TINC was not a significant predictor in this model. A similar model was estimated with TONC scores $F(6, 53) = 8.09$, $p < 0.001$, $R^2 = 0.48$). TONC exhibited a significant inverse association with meanness above and beyond boldness, disinhibition, age, education, and intelligence.

Finally, a model was estimated with boldness scores as the outcome regressed on age, education level, intelligence, disinhibition, meanness, and TINC $F(6, 53) = 4.32$, $p < .001$, $R^2 = 0.33$). TINC was negatively associated with boldness above and beyond all covariates. Meanness also exhibited a positive association with boldness, while the effect of disinhibition was not significant. A similar model was estimated with TONC scores $F(6, 53) = 3.41$, $p = 0.01$, $R^2 = 0.28$), where TONC was not a significant predictor of boldness.

Discussion

This study examined the role of emotional attention regulation in incarcerated men as a potential pathway to traits consistent with the two-factor model of psychopathy (Hare, 2016). The hypothesized effects of emotional attention regulation ability were not supported for both individual factors and the total score of the PCL:SV. The ability to regulate attention toward or away from emotions is an important aspect of adaptive emotional functioning and in overall well-being (Boden & Thompson, 2015; Elfenbein et al., 2017; Huang et al., 2013; Thompson, 2009). However, this does not appear to be directly relevant to the psychopathy as measured by the interview-based PCL:SV in the current study. However, due to validity concerns related to the PCL:SV in the current sample, investigation into alternative models of psychopathy was warranted and exploratory analyses were conducted. These exploratory analyses suggested alternative models of psychopathy may provide a more relevant lens to view emotional attention regulation in relation to psychopathy. Indeed, exploratory analyses suggest TINC and TONC exhibit significant associations with two of the three scales of the triarchic model of psychopathy (Patrick et al., 2009), though the direction of the association differs depending on the specific emotional attention regulation skill. The discussion session will first review the results of the

hypothesized effects of TINC and TONC on PCL:SV measures. Discussion related to exploratory analyses of the TriPM will follow.

Emotional Attention Regulation

While hypothesized associations between TINC and TONC and the PCL:SV were not supported in the current study, attention (and attention to emotions) has been shown across previous research to be constructs of interest within the literature (Glenn & Raine, 2014). This is evident across numerous cross-sectional and experimental paradigms in which individuals high in psychopathy demonstrate deficits in the deployment of attention and differentiation of emotions (Brook et al., 2013; Kimonis et al., 2019; Kosson et al., 2018). The negative preception hypothesis, or the theory that individuals high in psychopathic traits develop the ability to adaptively attenuate the intensity of noxious stimuli (i.e., aversive emotional states), states that the interplay between attention and emotions develops to contribute to pervasive affective deficits over time (Kosson et al., 2018). This results in a generalized deficit in the ability to attend to emotional stimuli in one's environment. Thus, the affective deficits core to the construct of psychopathy are posited to be potentiated by poor ability to modulate attention towards or away from emotions. However, performance on an experimental task of tuning into or out emotional cues did not exhibit such a relation with either the interpersonal and affective (Factor 1) nor antisocial / lifestyle (Factor 2) scales of the PCL:SV. One potential explanation for the lack of support for hypothesized effects in the current study may be due to the attention bottleneck observed in individuals exhibiting elevated traits of psychopathy (Hiatt et al., 2004). That is, due to the elevated level of psychopathic traits in the sample, participants were able to appropriately focus attention on the correct response due to the goal-congruent nature of the task. Similarly, lack of support for proposed effects may indicate that the ability to modulate attention

towards or away from emotional stimuli (in the context of a controlled experimental setting) does not properly capture the same skills required to adaptively employ reactive appropriate behaviors in a more realistic scenario. For example, an individual being instructed to attend to the non-verbal emotional content of an audible or visual stimuli may be more likely to directly attend to such material as their focus is being directed towards the cues via instructions. However, this is not the case in real-world scenarios in which non-verbal emotional cues may be more likely to fall to the wayside in the stead of more motivational goals. Thus, these results fail to yield additional support for the negative preception hypothesis (Kosson et al., 2018), as tuning in to or out emotional stimuli did not appear to be a marked deficit in individuals with elevated traits of psychopathy.

Emotion Specific Predictors

Similar to the higher order TINC and TONC variables, relationships for TINC and TONC performance across all discrete emotional cues (happiness, sadness, fear) were also insignificant. This result is inconsistent with prior research suggesting more severe affective processing difficulties when differentiating some emotions over others, specifically with responsivity to fear being demonstrated across numerous paradigms and studies (Blair, 2005; Brook et al., 2013; Igoumenou et al., 2017). While meta-analyses suggest individuals with elevated psychopathic traits demonstrate more difficulty differentiating fear from other emotional states (Blair, 2005), the current results suggest there were no significant difference when tasked with differentiating fear amongst competing stimuli when compared to sadness or happiness. This may be explained by differences in experimental approaches, as the experimental task in the current study required participants to differentiate non-verbal emotional cues while distracting stimuli was presented concurrently. Alternatively, this difference in fear responsivity from preceding literature may

also be explained by deficits in emotion recognition for any emotion being less pronounced when being instructed to attend to a particular emotional state (i.e., instructions that tell the participant to select the image portraying fear as opposed to more directly identifying the emotion). This would be consistent with positive performance on the task being goal-directed and aligned with the attention-bottleneck theory in individuals high in psychopathy (Hiatt et al., 2004). Further examination into performance differences across experimental paradigms may yield additional context to these findings.

Exploratory Analyses Discussion

Results of exploratory analyses using an alternative model of psychopathy (Patrick et al., 2009) suggest that the ability to appropriately modulate attention towards or away from emotional stimuli is relevant to the phenotypic components of the triarchic conceptualization of psychopathy (see Table 6). Interestingly, TINC and TONC performance were shown to be predictors of different scales but in contrasting directions. TONC (Tuning out non verbal cues) was a significantly inversely associated with meanness, such that as participant's performance on the TONC trials decreased, their self-reported meanness elevated. This is theoretically consistent with the a priori hypothesis that poorer performance on TONC would be associated with Factor 2 scores. While not conceptually identical to the lifestyle and antisocial elements of Factor 2, meanness does include elements of behavioral dysregulation (e.g., aggression) and callousness that likely facilitates antisocial behavior. Conversely, TINC performance demonstrated a positive predictive relationship with boldness. As performance on TINC increased, so did their self-reported boldness scores as indicated by the TriPM. This finding is at odds with the a priori hypothesis that TINC performance would be inversely associated with Factor 1 scores. However, while there is some conceptual overlap between boldness and the interpersonal and affective

deficits consistent with Factor 1 of the Hare model (Patrick et al., 2009), boldness also attempts to capture potential beneficial aspects that may accompany psychopathy (e.g., self-esteem, stress immunity, etc.).

Meanness

Meanness in the TriPM involves lack of empathy, exploitation, and cruelty (Patrick et al., 2009; Sleep, Weiss, Lynam, & Miller, 2019). Furthermore, the scale has demonstrated convergent validity amongst measures of detachment, poor impulse control, aggression, and externalizing behavior (Sleep et al., 2019). Meanness as described by the TriPM appears to be a core feature of psychopathy across multiple conceptualizations of the construct and may even be necessary and sufficient for psychopathy (Cleckley, 1988; Miller et al., 2016; Sleep et al., 2019). In the current study, as performance on a task of tuning out non-verbal emotional stimuli decreased, meanness (TriPM) elevated. Consistent with the process model of emotion regulation (Ford & Gross, 2018; Gross, 2014), the inverse association between TONC and meanness may signify that the distraction imposed by peripheral emotional cues interrupting the identification stage of regulation and contribute to callous and aggressive behavior (see Figure 2). For example, an individual high in psychopathic traits may attend to negatively valanced non-verbal emotional cues (e.g., a brief frown or negative intonation while speaking) in an encounter with a figure of authority, which would then result in potentially problematic employment of regulation strategies that are more congruent to the perceived non-verbal cues instead of the situation. An example of this would be if an individual has difficulty regulating attention away from non-verbal cues that suggest disgust or disrespect, and engages in assaultive behavior instead of following the instructions of the individual that are likely more consistent with the demands of the environment (e.g., prison).

Furthermore, poor ability to attend to only the most salient non-verbal emotional cues in one's environment may contribute to poorer adaptive regulation. One potentially troublesome example of this could be in individuals high in psychopathy that find their own emotional cues intruding and "overriding" the salient emotional cues that may be present in their environment (e.g., a partner crying, an acquaintance emoting fear, etc.).

Boldness

Conversely, the boldness scale generally represents social dominance, stress immunity, risk taking, narcissism, and high self-esteem (Yoon et al., 2021). Interestingly, boldness has been shown to be a marker of social potency and adaptive functioning (Sleep et al., 2019). However, the level of relevance boldness holds to psychopathy is a source of ongoing discourse in the field due to weak relationships with other externalizing behaviors (Crowe et al., 2021). Overall, adaptive ability to regulate attention to emotions poses numerous benefits to overall well-being and life-satisfaction (Elfenbein et al., 2017). Of note, performance on the TINC task is goal-directed and may demonstrate potential for a more Machiavellian utilization of the identification of non-verbal emotional cues in individuals high in psychopathic traits. To this degree, effective TINC performance provides needed emotional information that informs behavior in a way that could precede social dominance, leadership, etc. For example, if an individual high in psychopathy has a goal to manipulate or "con" a potential romantic partner into engaging in sex by navigating their non-verbal responses (e.g., a disgusted or sad emotional expression in response to a joking comment), this skill could be utilized for the pursuit of this goal. However, it is important to note that while this skill may be relevant to boldness as a component of the triarchic model, it was not a significant predictor of disinhibited behavior or meanness. Thus, while being able to identify and discriminate non-verbal emotional cues in the presence of

competing stimuli underlies adaptive functioning, it may also present one potential pathway to psychopathy in the presence of additional meanness and disinhibited characteristics.

Limitations

There are several limitations that should be noted. First, the sample size of the current study ($N = 60$) is modest and may be lacking sufficient power to detect smaller effect sizes (Cohen, 1988). Similarly, the sample in this study was recruited from a Midwestern prison in which participants were previously referred for a violence risk evaluation due to elevations on various static risk factors. In the current study, the constrained range of Factor 2 scores across participants is likely attributable to this sampling method. Of note, the majority of participants in this sample identified as Native American. While the cultural context of emotions may vary across Native American cultures, the emotions in the current study (i.e., happiness, sadness, fear) are believed to be universal and recognizable (via facial expression) across even culturally isolated societies (Crivelli, Jarillo, Russell, & Fernández-Dols, 2016). Furthermore, while this population is disproportionately represented in correctional settings, this disproportionality is particularly pronounced in the current sample. Nonetheless, there is evidence that the PCL-R (20 item version of the PCL:SV) shows similar psychometric properties in both indigenous and non-indigenous incarcerated individuals (Olver et al., 2018). However, the current sample may still not be representative of a general correctional sample. Thus, further assessment and replicated studies of emotional attention regulation in other populations in which psychopathy is a construct of interest may yield additional clarification in how these deficits may present.

Furthermore, psychopathy has been consistently found to be a heterogeneous construct throughout the literature (Hare et al., 2018; Hicks & Drislane, 2018; Zeier & Newman, 2013). While one of the objectives of the current study was to elucidate potential pathways to the

interpersonal / affective and antisocial factors, alternative models of psychopathy may provide more relevant outcomes in which difficulties in modulating attention toward or away from emotions apply to. The PCL:SV is also an interview-based measure in which the interviewer ranks the individual on numerous items. While the PCL:SV has shown good reliability and validity in forensic samples between raters (Higgs et al., 2018), there is still potential for rater bias. There were some concerns regarding PCL:SV validity in the current sample due to null relationships that have been replicated throughout the literature (e.g., positive association between Factor 1 and Factor 2). Finally, the EAR task (Elfenbein et al., 2017) is a newer experimental task that has not been used in a correctional setting prior to this study. Due to the nature of the correctional setting, it was not possible to complete all procedures within the same setting. Thus, there may have been some minor variation in data collection across settings (e.g., not perfectly quiet, differences across medium / maximum security, etc.). The performance across participants on these tasks also suggested a ceiling effect in which a majority of participants performed well across all tasks. Ceiling effects may introduce additional bias into regression models (McBee, 2010).

Future studies on emotional attention regulation and psychopathy would benefit from recruiting a larger and more representative sample as to better detect potentially smaller effect sizes and to better represent a normative correctional sample. Furthermore, investigation into the EAR task (Elfenbein et al., 2017) and its validity within correctional samples (and samples with lower historical education levels and cognitive capabilities) would also inform best experimental practices and measures to assess emotional attention regulation in high psychopathy incarcerated males.

Conclusion

Understanding mechanisms that underlie functioning in individuals with psychopathic traits is important in further defining psychopathy as a construct, differentiating potential variants of psychopathy, and enhancing the treatment for incarcerated individuals and at-risk youth with burgeoning psychopathic traits. Conceptually, the ability to regulate attention toward or away from emotional cues is an important aspect of functioning that ostensibly underlies behavioral outcomes and self-regulation ability. The current study tested if these skills, measured through an experimental task, were relevant to the construct of psychopathy. Performance on both tuning in and tuning out non-verbal stimuli were not significant predictors of Factor 1, Factor 2, and total PCL:SV scores. While these results do not highlight a particular predictor of interpersonal or affective, nor lifestyle or antisocial aspects of the Hare (2016) two-factor conceptualization of psychopathy, the body of literature preceding this study strongly suggests the intersection of both attention and emotions as a central component in understanding affective deficits and disinhibition in psychopathy. Interestingly, exploratory analyses illustrated a different picture in relation to emotional attention regulation and components of psychopathy on a self-report measure. Notably, the ability to regulate attention towards non-verbal emotional cues appears to be associated with increased boldness (i.e., fearlessness, social dominance, high self-esteem). In contrast, lower ability to modulate attention away from distracting non-verbal emotional cues was associated with increased meanness (i.e., poor empathy, cruelty, impulse control). The discrepancy between the results with the PCL:SV and the TriPM highlights the ongoing difficulty in conceptualizing and researching a construct as heterogenous as psychopathy. Future research would benefit from further exploring alternative models of psychopathy as well as alternative methods of assessment of emotional attention regulation to

better understand the complex relationship between this construct and the importance of attention and emotion.

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Table 1.

Experimental Outline for TINC and TONC Trials

Experimental Task	Target Stimulus	Distractor Stimulus	Correct Response	Interpretation for High Error Rate
Visual TINC	Facial Emotion	Red or Green Tint	Sad = press F; Happy = press J	
Incompatible Trial Ex.	Happy Face	Red Tint	Happy = Press J	Poor emotion recognition when under distracting visual conditions
Visual TONC	Facial Color	Happy or Sad Emotions	Red (Stop) = F; Green (Go) = J	
Incompatible Trial Ex.	Red Tint	Happy Face	Red (Stop) = F	Poor ability to regulate attention when distracted by nonverbal emotional cues
Auditory TINC	Vocal tone	Semantic Meaning of Word	Sad = press F; Happy = press J	
Incompatible Trial Ex.	Happy Tone	Semantic Meaning: Evil (negative)	Happy = press J	Poor emotion recognition when under distracting auditory conditions
Auditory TONC	Semantic Meaning of Word	Sad or Happy Vocal Tone	Negative = press F; Positive = press J	
Incompatible Trial Ex.	Semantic Meaning: Joyful (positive)	Sad Vocal Tone	Positive = press J	Poor ability to regulate attention when distracted by nonverbal emotional cues

Note. This outline shows the 4 experimental blocks for sad and happy emotions. Identical trials will also be conducted for fear and happy emotions, in which sad stimuli are replaced with fearful stimuli.

Table 2.

Descriptive Statistics

	Mean (SD)	Range	Skew	Kurtosis
Age	31.6 (6.85)	20 – 48	0.47	2.32
Education (in years)	10.98(2.01)	4 – 16	-0.67	4.80
PCL:SV	17.68 (3.40)	9 - 22	-0.64	2.50
Factor 1	7.87 (3.02)	1 – 12	-0.73	2.59
Factor 2	9.82 (1.32)	7 – 12	-0.41	2.90
TINC% Correct	0.87 (0.11)	0.6 – 1.0	-0.58	2.00
TONC% Correct	0.95 (0.09)	0.6 – 1.0	-2.84	10.78
TINC RT	4.96 (65.38)	-217 - 166	-0.87	4.52
TONC RT	19.95 (53.53)	-105 - 153	0.10	3.22
TI Happy % Correct	0.96 (0.04)	0.8 – 1.0	-1.94	8.34
TI Sad % Correct	0.96 (0.08)	0.5 – 1.0	-4.15	22.05
TI Fear % Correct	0.96 (0.05)	0.7 – 1.0	-2.49	10.78
TO Happy % Correct	0.96 (0.10)	0.5 – 1.0	-4.28	21.83
TO Sad % Correct	0.95 (0.16)	0.1 – 1.0	-4.70	25.75
TO Fear % Correct	0.97 (0.08)	0.4 – 1.0	-5.76	40.20
TriPM	33.47 (7.52)	9.66 – 50.33	-0.10	3.83
TriPM: Meanness	25.08 (10.53)	6 - 52	0.78	2.79
TriPM: Boldness	41.43 (7.53)	18 - 56	-0.79	4.01
TriPM: Disinhibition	33.88 (11.62)	5 - 58	-0.33	2.92
Number Felonies	4.05 (2.59)	1 - 13	1.20	4.51
Time Incarcerated	2770 (1994)	435 - 8940	1.64	5.22

Note. $N = 60$. TINC = Tuning into non-verbal cues. TONC = Tuning out non-verbal cues. RT = reaction time (mean difference between congruent and incongruent trials). TriPM = Triarchic Psychopathy Measure. Experimental task variables are scored on percentage correct out of available trials. TI = Tuning Into, TO = Tuning Out. Time Incarcerated = days in prison.

Table 3.

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PCL	1.00													
2. Factor 1	**0.92**	1.00												
3. Factor 2	**0.47**	0.08	1.00											
4. Age	0.05	0.08	-0.03	1.00										
5. Education	0.05	0.11	-0.12	-0.14	1.00									
6. Intelligence	-0.07	-0.12	0.08	0.01	0.20	1.00								
7. TINC %	-0.08	-0.07	-0.05	-0.01	0.18	**0.35**	1.00							
8. TONC %	0.02	0.00	0.05	0.00	0.04	**0.47**	**0.38**	1.00						
9. TINC Happy	-0.13	-0.09	-0.12	0.02	0.09	**0.34**	**0.41**	**0.40**	1.00					
10. TINC Sad	-0.18	-0.13	-0.17	-0.02	-0.00	0.19	**0.44**	**0.45**	**0.71**	1.00				
11. TINC Fear	-0.06	0.04	-0.25	-0.02	0.16	0.22	**0.42**	**0.33**	**0.56**	**0.70**	1.00			
12. TONC Happy	0.04	0.08	-0.08	-0.02	0.02	**0.26**	0.17	**0.84**	.011	0.15	0.24	1.00		
13. TONC Sad	0.06	0.08	-0.05	0.02	-0.01	**0.26**	0.14	**0.80**	0.10	0.23	0.21	**0.93**	1.00	
14. TONC Fear	-0.10	-0.10	-0.03	-0.08	0.17	**0.29**	**0.25**	**0.30**	0.10	0.01	0.11	**0.29**	0.03	1.00
15. TriPM	**-0.27**	**-0.25**	-0.15	-0.14	-0.14	0.10	-0.03	**-0.22**	0.16	0.13	0.12	-0.15	-0.18	0.12
16. TriPM: Meanness	-0.16	-0.18	-0.00	-0.13	-0.07	0.09	-0.06	**-0.26**	0.04	-0.01	-0.07	-0.20	-0.21	0.10
17. TriPM: Boldness	-0.19	-0.13	-0.17	0.05	0.08	0.09	0.23	**-0.05**	**0.54**	**0.39**	**0.37**	-0.12	-0.15	0.06
18. TriPM Disinhib.	**-0.27**	-0.23	-0.17	-0.18	**-0.27**	0.05	-0.10	-0.15	-0.08	-0.01	0.05	-0.05	-0.07	0.09
19. IAE	-0.08	-0.09	-0.01	0.15	-0.11	-0.14	0.10	0.02	-0.10	0.08	-0.16	-0.07	-0.01	-0.16
20. VAE	0.05	0.04	0.04	-0.00	-0.09	-0.25	**-0.30**	**-0.32**	**-0.38**	**-0.36**	**-0.39**	**-0.31**	**-0.26**	-0.11

	15.	16.	17.	18.	19.	20.
15. TriPM	1.00					
16. TriPM: Meanness	**0.87**	1.00				
17. TriPM: Boldness	**0.60**	**0.48**	1.00			
18. TriPM: Disinhib.	**0.76**	**0.48**	0.08	1.00		
19. IAE	-0.15	-0.09	-0.20	-0.07	1.00	
20. VAE	0.19	**0.33**	-0.19	0.17	**0.44**	1.00

Note. *N* = 60. PCL = total PCL:SV score. TINC = Tuning into non-verbal cues. TONC = Tuning out non-verbal cues. Significant correlations in bold. TriPM = Triarchic Model of Psychopathy. IAE = Involuntary Attention to Emotions. VAE = voluntary attention to emotions. Emotion specific variables are for visual trials only.

Table 4.

Regression Analyses Results for PCL:SV Scales on TINC Performance

Step and Variable	B	SE	β	*p*	R^2 / Δ R^2
Factor 1 (interpersonal/affective)					
Step 1					
Age	0.04	0.06	0.10	0.45	$R^2 = 0.040$
Education	0.23	0.20	0.15	0.26	
Intellectual Functioning	-0.04	0.03	-0.14	0.27	
Step 2					
Age	0.04	0.06	0.16	0.46	Δ $R^2 = 0.004$
Education	0.24	0.21	0.65	0.25	
Intellectual Functioning	-0.03	0.03	0.37	0.36	
TINC	-1.50	3.99	6.50	0.71	
Step 3					
Age	0.05	0.06	0.11	0.43	Δ $R^2 = 0.014$
Education	0.27	0.21	0.18	0.21	
Intellectual Functioning	-0.04	0.03	-0.15	0.31	
TINC	-1.24	4.01	-0.04	0.76	
Factor 2	0.28	0.31	0.12	0.37	
					$F(5, 54) = 0.67$, $p = 0.65$
Factor 2 (lifestyle/antisocial)					
Step 1					
Age	-0.01	0.03	-0.06	0.67	$R^2 = 0.029$
Education	-1.00	0.09	-0.15	0.27	
Intellectual Functioning	0.01	0.01	0.11	0.42	
Step 2					
Age	-0.01	0.03	0.04	0.67	Δ $R^2 = 0.005$
Education	-0.09	0.09	0.09	0.30	
Intellectual Functioning	0.01	0.02	0.04	0.25	
TINC	-0.93	1.75	2.58	0.60	
Step 3					
Age	-0.13	0.03	-0.07	0.61	Δ $R^2 = 0.083$
Education	-0.11	0.09	-0.16	0.25	
Intellectual Functioning	0.02	0.15	0.15	0.30	
TINC	-0.85	1.76	-0.07	0.63	
Factor 1	0.05	0.06	0.12	0.37	
					$F(5, 54) = 0.55$, $p = 0.74$
PCL:SV Total					
Step 1					
Age	0.03	0.07	0.07	0.62	$R^2 = 0.014$
Education	0.13	0.23	0.08	0.58	
Intellectual Functioning	-0.02	0.04	-0.09	0.51	
Step 2					
Age	0.03	0.07	0.07	0.63	Δ $R^2 = 0.005$
Education	0.14	0.23	0.09	0.54	
Intellectual Functioning	-0.02	0.04	-0.06	0.66	
TINC	-2.43	4.55	-0.08	0.60	
					$F(4, 55) = 0.27$, $p = 0.90$

Note: N = 60.

Table 5.

Regression Analyses Results for TONC Performance

Step and Variable	B	SE	β	*p*	R^2 / Δ R^2
Factor 1 (interpersonal/affective)					
Step 1					
Age	0.04	0.06	0.10	0.45	$R^2 = 0.040$
Education	0.23	0.20	0.15	0.26	
Intellectual Functioning	-0.04	0.03	-0.14	0.27	
Step 2					
Age	0.04	0.06	0.16	0.46	Δ $R^2 = 0.007$
Education	0.24	0.20	0.16	0.25	
Intellectual Functioning	-0.05	0.04	-0.19	0.22	
TONC	3.03	5.29	0.09	0.57	
Step 3					
Age	0.05	0.06	0.11	0.42	Δ $R^2 = 0.015$
Education	0.27	0.21	0.18	0.21	
Intellectual Functioning	-0.05	0.04	-0.20	0.19	
TONC	3.02	5.30	-0.09	0.57	
Factor 2	0.28	0.31	0.12	0.36	
					$F(5, 54) = 0.72$, $p = 0.61$
Factor 2 (lifestyle/antisocial)					
Step 1					
Age	-0.01	0.03	-0.06	0.67	$R^2 = 0.029$
Education	-1.00	0.09	-0.15	0.27	
Intellectual Functioning	0.01	0.01	0.11	0.42	
Step 2					
Age	-0.01	0.03	-0.06	0.67	Δ $R^2 < .001$
Education	-0.10	0.09	-0.15	0.27	
Intellectual Functioning	0.01	0.02	0.11	0.48	
TONC	0.03	2.40	0.01	0.99	
Step 3					
Age	-0.01	0.03	-0.07	0.60	Δ $R^2 = 0.016$
Education	-0.11	0.09	-0.17	0.22	
Intellectual Functioning	0.01	0.02	0.13	0.40	
TONC	-0.14	2.34	-0.01	0.95	
Factor 1	0.06	0.05	0.13	0.36	
					$F(5, 54) = 0.50$, $p = 0.77$
PCL:SV Total					
Step 1					
Age	0.03	0.07	0.07	0.62	$R^2 = 0.014$
Education	0.13	0.23	0.08	0.58	
Intellectual Functioning	-0.02	0.04	-0.09	0.51	
Step 2					
Age	0.03	0.07	0.07	0.62	Δ $R^2 = 0.005$
Education	0.14	0.23	0.08	0.56	
Intellectual Functioning	-0.03	0.04	-0.13	0.42	
TONC	3.06	6.04	0.08	0.62	
					$F(4, 55) = 0.26$, $p = 0.90$

Note: N = 60.

Table 6.

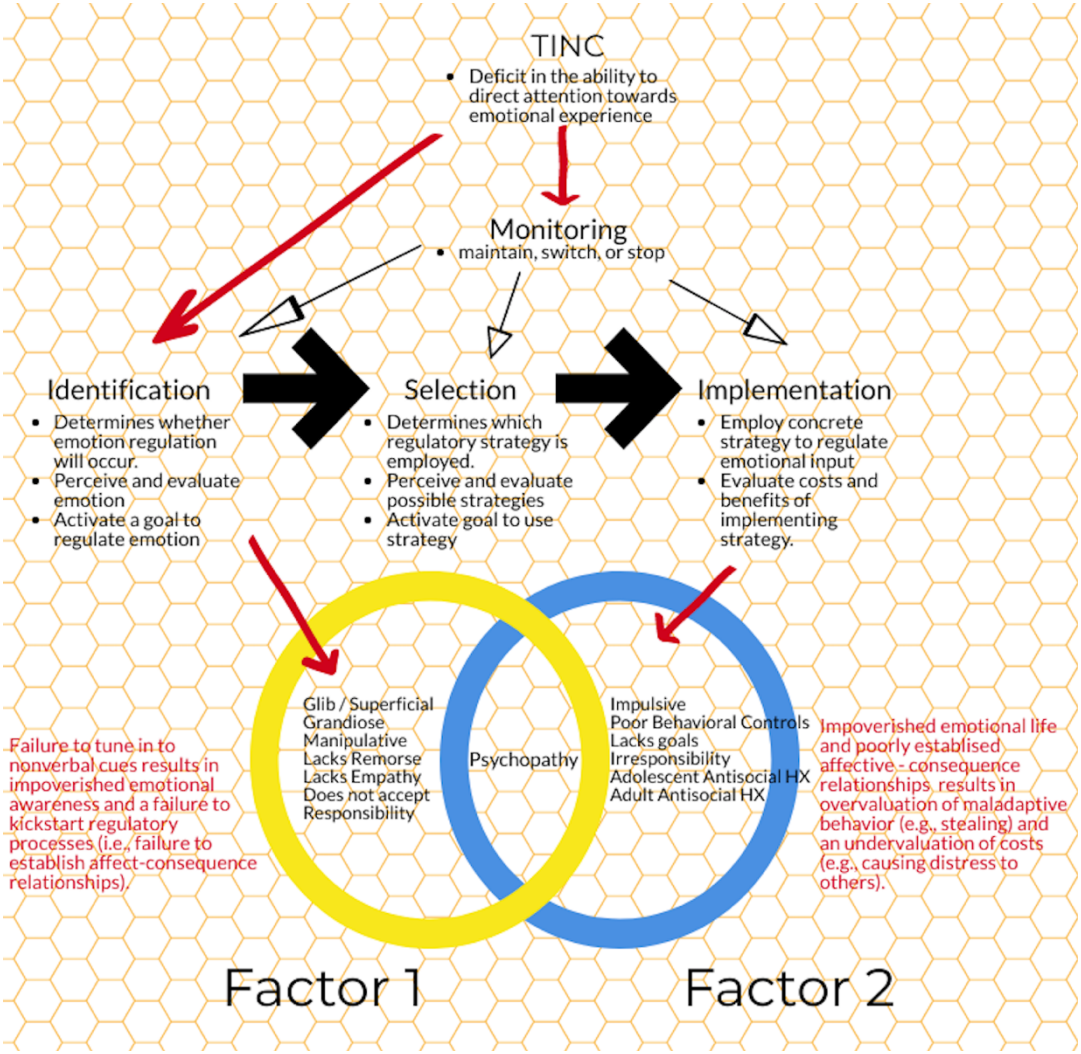
Exploratory Analyses Regression Results

Variable	B	SE	β	*p*	R^2
TINC Regression Analyses					
TrPM: Meanness					$R^2 = 0.45$
Boldness	0.67	0.15	0.48	<0.001	
Disinhibition	0.37	0.10	0.40	<0.001	
Age	-0.12	0.16	-0.08	0.455	
Education	0.02	0.59	0.003	0.978	
Intellectual Functioning	0.07	0.09	0.08	0.470	
TINC	-14.97	11.08	-0.15	0.183	
TrPM: Boldness					$R^2 = 0.33$
Meanness	0.41	0.09	0.58	<0.001	
Disinhibition	-0.08	0.09	-0.13	0.345	
Age	0.12	0.13	0.11	0.339	
Education	0.25	0.46	0.07	0.596	
Intellectual Functioning	-0.03	0.07	-0.05	0.658	
TINC	17.74	8.54	0.25	0.043	
TrPM: Disinhibition					$R^2 = 0.33$
Boldness	-0.20	0.21	-0.13	0.345	
Meanness	0.54	0.15	0.49	<0.001	
Age	-0.27	0.20	-0.16	0.184	
Education	-1.5	0.68	-0.26	0.032	
Intellectual Functioning	0.08	0.11	0.08	0.510	
TINC	-2.90	13.69	-0.03	0.834	
TONC Regression Analyses					
TrPM: Meanness					$R^2 = 0.48$
Boldness	0.60	0.14	0.43	<0.001	
Disinhibition	0.33	0.10	0.37	0.002	
Age	-0.14	0.16	-0.09	0.389	
Education	-0.21	0.58	-0.04	0.717	
Intellectual Functioning	0.14	0.10	0.17	0.163	
TONC	-32.49	14.34	-0.26	0.028	
TrPM: Boldness					$R^2 = 0.28$
Meanness	0.42	0.10	0.59	<0.001	
Disinhibition	-0.09	0.09	-0.14	0.320	
Age	0.12	0.13	0.11	0.358	
Education	0.37	0.48	0.10	0.449	
Intellectual Functioning	-0.01	0.09	-0.01	0.932	
TONC	7.29	12.59	-0.08	0.565	
TrPM: Disinhibition					$R^2 = 0.33$
Boldness	-0.20	0.20	-0.13	0.320	
Meanness	0.52	0.16	0.47	0.002	
Age	-0.27	0.20	-0.16	0.174	
Education	-1.56	0.69	-0.27	0.027	
Intellectual Functioning	0.10	0.13	0.11	0.420	
TONC	-9.79	18.70	-0.07	0.603	

Note: N = 60. Significant predictor variables in bold.

Figure 1.

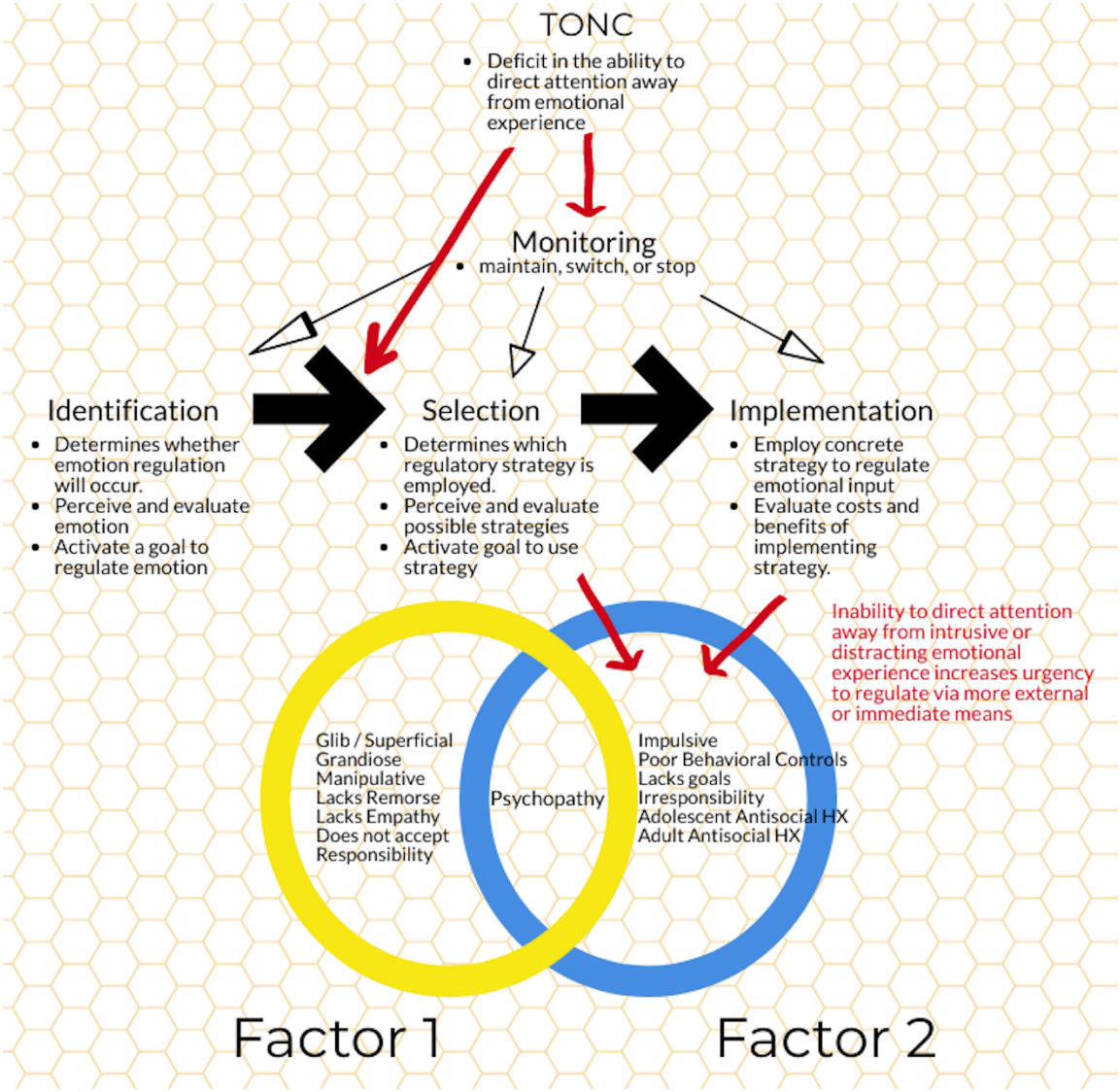
Tuning Into Nonverbal Cues (TINC) Visual Aid



Note: Figure overlays TINC ability onto psychopathy and the process model of emotion regulation (Gross, 2015; Ford & Gross, 2018). TINC is expected to predict total, Factor 1, and Factor 2 scores on PCL:SV. This relationship is expected to reflect disruption of the identification and monitoring stages in which emotional awareness and evaluation of emotional experience is important in identifying a goal to regulate emotion and determining whether regulation either needs to be continued, stopped, or switched to another strategy.

Figure 2.

Tuning Out Nonverbal Cues (TONC) Visual Aid



Note. Figure overlays TONC ability onto psychopathy and the process model of emotion regulation (Gross, 2015; Ford & Gross, 2018). TONC is expected to predict total PCL:SV and Factor 2 scores. This relationship is expected to reflect distraction imposed by negative or intrusive emotional experiences that facilitate an urgency to regulate emotions.

APPENDICES

Note: Measures were formatted for computer-based completion.

APPENDIX A

Demographic Information

Please select the most appropriate answer.

1. Age: Please list your age. _____
2. How many years in school have you completed? (e.g., graduated from high school = 12 years). _____
3. Do you consider yourself Hispanic or Latino? Yes No
4. Please choose one racial group that best describes you.
    1. Asian
    2. Black or African American
    3. Native American or Alaskan Native
    4. Native Hawaiian or other Pacific Islander
    5. White
    6. Multiracial
    7. Other
5. Have you ever been diagnosed with ADHD? Yes No
6. Are you colorblind? Yes No
7. Are you currently taking any psychotropic medication? Yes No

APPENDIX B

Triarchic Psychopathy Measure

Directions: This questionnaire contains statements that different people might use to describe themselves. Each statement is followed by four choices: T ST SF F. The meaning of these four different choices is as follows:

T = True TS = somewhat true SF = somewhat false F = False For each statement, fill in the bubble for the choice that describes you best. There are no right or wrong answers; just choose the answer that best describes you.

1. I'm optimistic more often than not.
2. How other people feel is important to me.
3. I often act on immediate needs.
4. I have no strong desire to parachute out of an airplane.
5. I've often missed things I promised to attend.
6. I would enjoy being in a high-speed chase.
7. I am well-equipped to deal with stress.
8. I don't mind if someone I dislike gets hurt.
9. My impulsive decisions have caused problems with loved ones.
10. I get scared easily.
11. I sympathize with others' problems.
12. I have missed work without bothering to call in.
13. I'm a born leader.
14. I enjoy a good physical fight.
15. I jump into things without thinking.

16. I have a hard time making things turn out the way I want.
17. I return insults.
18. I've gotten in trouble because I missed too much school.
19. I have a knack for influencing people.
20. It doesn't bother me to see someone else in pain.
21. I have good control over myself.
22. I function well in new situations, even when unprepared.
23. I enjoy pushing people around sometimes.
24. I have taken money from someone's purse or wallet without asking.
25. I don't think of myself as talented.
26. I taunt people just to stir things up.
27. People often abuse my trust.
28. I'm afraid of far fewer things than most people.
29. I don't see any point in worrying if what I do hurts someone else.
30. I keep appointments I make.
31. I often get bored quickly and lose interest.
32. I can get over things that would traumatize others.
33. I am sensitive to the feelings of others.
34. I have conned people to get money from them.
35. It worries me to go into an unfamiliar situation without knowing all the details.
36. I don't have much sympathy for people.
37. I get in trouble for not considering the consequences of my actions.
38. I can convince people to do what I want.

39. For me, honesty really is the best policy.
40. I've injured people to see them in pain.
41. I don’t like to take the lead in groups.
42. I sometimes insult people on purpose to get a reaction from them.

43. I have taken items from a store without paying for them.
44. It's easy to embarrass me.
45. Things are more fun if a little danger is involved.
46. I have a hard time waiting patiently for things I want.
47. I stay away from physical danger as much as I can.
48. I don't care much if what I do hurts others.
49. I have lost a friend because of irresponsible things I've done.
50. I don't stack up well against most others.
51. Others have told me they are concerned about my lack of self-control.
52. It’s easy for me to relate to other people’s emotions.
53. I have robbed someone.
54. I never worry about making a fool of myself with others.
55. It doesn’t bother me when people around me are hurting.
56. I have had problems at work because I was irresponsible.
57. I’m not very good at influencing people.
58. I have stolen something out of a vehicle.

APPENDIX C

Positive and Negative Affectivity Schedule (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you generally feel this way, that is, how you feel on the average. Use the following scale to record your answers.

1 very slightly or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
	_____ interested		_____ irritable	
	_____ distressed		_____ alert	
	_____ excited		_____ ashamed	
	_____ upset		_____ inspired	
	_____ strong		_____ nervous	
	_____ guilty		_____ determined	
	_____ scared		_____ attentive	
	_____ hostile		_____ jittery	
	_____ enthusiastic		_____ active	
	_____ proud		_____ afraid	

APPENDIX D

Attention to Emotion Measures

Instructions: Select the item from the menu that best describes you.

1. Strongly agree
2. Mildly agree
3. Agree and disagree equally
4. Mildly disagree
5. Strongly disagree

1. I can't help paying attention to my emotions.
2. I find myself paying attention to my feelings even when I don't intentionally try to do so.
3. I tend to pay attention to my emotions even when I don't want to.
4. It would be difficult for me to not pay attention to my emotions, even if I tried.
5. Paying attention to my emotions is not something I can control.
6. I unintentionally think about my feelings.
7. I automatically evaluate my mood.
8. I'm interested in the emotional aspect of my life.
9. I think about and try to understand my emotional reactions.
10. Being in touch with emotions is essential.
11. I find examination of my feelings useful in solving personal problems.
12. I don't usually care much about what I'm feeling.
13. I don't think it's worth paying attention to our emotions or moods.
14. It is usually a waste of time to think about your emotions.
15. People would be better off if they felt less and thought more.

APPENDIX E

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1	2	3	4	5
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

_____ 1) I am clear about my feelings.
_____ 2) I pay attention to how I feel.
_____ 3) I experience my emotions as overwhelming and out of control.
_____ 4) I have no idea how I am feeling.
_____ 5) I have difficulty making sense out of my feelings.
_____ 6) I am attentive to my feelings.
_____ 7) I know exactly how I am feeling.
_____ 8) I care about what I am feeling.
_____ 9) I am confused about how I feel.
_____ 10) When I'm upset, I acknowledge my emotions.
_____ 11) When I'm upset, I become angry with myself for feeling that way.
_____ 12) When I'm upset, I become embarrassed for feeling that way.
_____ 13) When I'm upset, I have difficulty getting work done.
_____ 14) When I'm upset, I become out of control.
_____ 15) When I'm upset, I believe that I will remain that way for a long time.
_____ 16) When I'm upset, I believe that I will end up feeling very depressed.
_____ 17) When I'm upset, I believe that my feelings are valid and important.
_____ 18) When I'm upset, I have difficulty focusing on other things.
_____ 19) When I'm upset, I feel out of control.
_____ 20) When I'm upset, I can still get things done.
_____ 21) When I'm upset, I feel ashamed at myself for feeling that way.
_____ 22) When I'm upset, I know that I can find a way to eventually feel better.
_____ 23) When I'm upset, I feel like I am weak.
_____ 24) When I'm upset, I feel like I can remain in control of my behaviors.
_____ 25) When I'm upset, I feel guilty for feeling that way.
_____ 26) When I'm upset, I have difficulty concentrating.
_____ 27) When I'm upset, I have difficulty controlling my behaviors.
_____ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.
_____ 29) When I'm upset, I become irritated at myself for feeling that way.
_____ 30) When I'm upset, I start to feel very bad about myself.
_____ 31) When I'm upset, I believe that wallowing in it is all I can do.
_____ 32) When I'm upset, I lose control over my behavior.
_____ 33) When I'm upset, I have difficulty thinking about anything else.
_____ 34) When I'm upset I take time to figure out what I'm really feeling.
_____ 35) When I'm upset, it takes me a long time to feel better.
_____ 36) When I'm upset, my emotions feel overwhelming.

APPENDIX F

Manifest Anxiety Scale

Instructions: The statements below inquire about your behavior and emotions. Consider each statement carefully. Then indicate whether the statements are generally true or false for you. Check true or false in the spaces provided.

1. I do not tire quickly. _____
2. I believe I am no more nervous than others. _____
3. I have very few headaches. _____
4. I work under a great deal of tension. _____
5. I frequently notice my hand shakes when I try to do something. _____
6. I blush no more often than others. _____
7. I have diarrhea once a month or more. _____
8. I worry quite a bit over possible misfortunes. _____
9. I practically never blush. _____
10. I am often afraid that I am going to blush. _____
11. My hands and feet are usually warm enough. _____
12. I sweat very easily even on cool days. _____
13. Sometimes when embarrassed, I break out in a sweat. _____
14. I hardly ever notice my heart pounding, and I am seldom short of breath. _____
15. I feel hungry almost all of the time. _____
16. I am very seldom troubled by constipation. _____
17. I have a great deal of stomach trouble. _____
18. I have had periods in which I lost sleep over worry. _____
19. I am easily embarrassed. _____
20. I am more sensitive than most other people. _____
21. I frequently find myself worrying about something. _____
22. I wish I could be as happy as others seem to be. _____
23. I am usually calm and not easily upset. _____
24. I feel anxiety about something or someone almost all of the time. _____
25. I am happy most of the time. _____
26. It makes me nervous to have to wait. _____
27. Sometimes I become so excited I find it hard to get to sleep. _____
28. I have sometimes felt that difficulties piling up so high I couldn't get over them. _____
29. I admit I have felt worried beyond reason over small things. _____
30. I have very few fears compared to my friends. _____
31. I certainly feel useless at times. _____
32. I find it hard to keep my mind on a task or job. _____
33. I am usually self-conscious. _____
34. I am inclined to take things hard. _____
35. At times I think I am no good at all. _____
36. I am certainly lacking in self-confidence. _____

37. I sometimes feel that I am about to go to pieces. _____
38. I am entirely self-confident. ____

APPENDIX F

UNIVERSITY OF SOUTH DAKOTA
Institutional Review Board
Informed Consent Statement

Title of Project:	Attention and Emotion in Corrections
Principal Investigator:	Jeffrey Simons, 205 South Dakota Union Building, Vermillion, SD (605) 658-3710, Jeffrey.simons@usd.edu
Student Investigator:	Michael Webb, 404 South Dakota Union Building, Vermillion, SD (605) 658-3710, Michael.webb01@usd.edu

Invitation to be Part of a Research Study:
You have been selected to participate in this study because you have previously been referred to the Risk Reduction Program at South Dakota State Penitentiary (SDSP). In order to participate, you must be male and between the ages of 18 and 50. About 70 people will take part in this research. Taking part in this research project is **completely voluntary.**

Purpose of the Study:
The purpose of this research study is to better understand the associations between emotions and attention among individuals in the correctional systems.

What will happen if you take part in this study?:
Upon completing this consent form, you will be asked to answer several computerized questionnaires regarding some of your experiences, emotions, and attention. You will also be asked to complete a computerized task in which you make selections while being shown images of faces and recordings of sounds. As part of the study, some of your records at the prison may be accessed. This may include information related to your age, offense history, disciplinary infractions, mental health, or sentence length.

The study will take place over two sessions lasting about an hour each time. In the first session, you will complete a brief assessment and several questionnaires. In the second, you will complete the computerized task.

Risks:
There are no risks in participating in this research beyond those experienced in everyday life. You may experience frustration that is often experienced when completing surveys or brief assessments. Some questions may be of a sensitive nature, and therefore you may become upset as a result. However, these risks are not viewed as being in excess of your experiences in everyday life.

Benefits
You may not benefit personally from participating in this research project. However, we hope that other people in correctional systems might benefit from this study because you are helping us understand the relationship between attention and emotions.
Duration:
It will take about 60 minutes to complete the first meeting. It will take about 60 minutes to complete the second meeting. The two sessions will be separated by approximately one week.

Statement of Confidentiality:
The questionnaires do not ask for any information that would identify who the responses belong to. Therefore, your responses are recorded confidentially and may only be linked to you via a linking research ID that will be stored separately in a locked file or secure server or device. If this research is published, no information that would identify you will be included. All questionnaire responses that we receive will be treated confidentially and stored on a secure server. Paper materials will be stored in a secure location on University of South Dakota campus. Your responses will remain confidential and will have no consequence on South Dakota DOC outcomes such as parole, earned discharge credits, housing, etc.

If you tell us something that makes us believe that you are a present harm to yourself or others, we may report that information to the appropriate agencies.

Right to Ask Questions:
The researchers conducting this study are Jeffrey Simons and Michael Webb. If you later have questions, concerns, or complaints about the research please contact Michael Webb at (605) 658-3710 during the day. Additionally, you may contact the faculty advisor and principal investigator for this study, Jeffrey S. Simons, at the aforementioned number. If you have questions regarding your rights as a research subject, you may contact The University of South Dakota- Office of Human Subjects Protection at (605) 658-3743. You may also call this number with problems, complaints, or concerns about the research. Please call this number if you cannot reach research staff, or you wish to talk with someone who is an informed individual who is independent of the research team.

Compensation:
You will be awarded $5 for each completed hour-long meeting. This results in a total of $10 for your participation in both meetings. This compensation will be distributed though the tablet system at SDSP.

Voluntary Participation:
It is totally up to you to decide to be in this research study. You do not have to participate in this research. You may refuse to participate or choose to discontinue participation at any time without losing any benefits to which you are otherwise entitled. You do not have to answer any questions you do not want to answer. Deciding to participate or to not participate in this research project will have no effect on DOC outcomes. This means that declining to participate or

choosing to participate will not affect things like parole determination, earned discharge credits, housing, or others. This project is unaffiliated with the South Dakota Department of Corrections.

Your Consent:
Before agreeing to be part of the research, please be sure that you understand what the study is about. We will give you a copy of this document for your records. If you have any questions about the study later, you can contact the study team using the information provided above.

I understand that by signing below, I volunteer to participate in this research. I understand that I am not waiving any legal rights. I have been provided with a copy of this consent form. I understand that if my ability to consent or assent for myself changes, either I or my legal representative may be asked to re-consent prior to my continued participation in this study.

Subject's Name: _____

_____ _____
Signature of Subject Date

_____ _____
Witness Date

Consent for contact for future studies: In addition to the current study, with your consent we may also attempt to contact you for potential future opportunities to participate in research. I understand by signing below, I volunteer to be contacted about future research projects. **This does not mean that you are agreeing to participate in any future studies, but only that you are willing to be contacted should another research project take place in the future**.

_____ _____
Signature of Subject Date

_____
Other contact information if applicable (email, phone #)