PSYCHOPATHY AS A FEMALE PHENOTYPIC EXPRESSION OF BORDERLINE PERSONALITY DISORDER? IMPLICATIONS FOR THE LATENT STRUCTURE OF EMOTIONAL DYSREGULATION

BY

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DISSERTATION

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ABSTRACT

Although research supports the existence of primary and secondary psychopathy variants in men, little work has examined psychopathy variants in women. Research on gender differences is important, as evidence suggests that the interaction of the interpersonal-affective (F1) and impulsive-antisocial (F2) features of psychopathy is associated with borderline personality disorder (BPD) in women. This has prompted some theorists to propose that secondary psychopathy actually represents a female manifestation of BPD among women. However, empirical research in this area is lacking. Towards this end, the current project sought to achieve three goals using archival data collected across three different studies. These studies examined whether BPD, as well as the emotional dysregulation associated with the disorder, manifests in terms of secondary psychopathy in women. First, Studies 1 and 2 tested the hypothesis that the interaction of the two psychopathy factors is associated with BPD in women (Goal #1). Across both studies, results indicated that the interaction of F1 and F2 traits was associated with BPD in women; this association was found to be specific to women in Study 1.

Second, the current investigation moved beyond the BPD diagnosis in order to clarify how the underlying pathology associated with the disorder (i.e., emotional dysregulation) relates to psychopathy across genders (Goal #2). Before this could be accomplished, Study 3 evaluated four competing models of emotional dysregulation in men versus women – (1) a two-factor hierarchical model; (2) a developmental model; (3) a two-factor model; and (4) a one-factor model. Analyses revealed that emotional dysregulation is best represented by a one-factor model and, moreover, that this model demonstrates at least partial measurement invariance across genders. Supplementary analyses further clarified how the one-factor model relates to existing internalizing and externalizing dimensions of psychopathology.

Lastly, Study 3 determined whether the aforementioned relationship between the psychopathy factors and BPD in women is generalizable to the broader construct of emotional dysregulation. Namely, Study 3 examined whether the one-factor model of emotional dysregulation established per Goal 2 phenotypically manifests in terms of secondary psychopathy in women versus men (Goal #3). Similar to the findings of Goal #1, results indicated that the interaction of F1 and F2 psychopathy scores is associated with emotional dysregulation among women, but not men. This observed association between psychopathy and emotional dysregulation was also not accounted for by a history of childhood abuse. The findings of the current project are important for informing work on dimensional conceptualizations of personality psychopathology, moving towards more empirically-derived psychopathology constructs, and refining how their manifestations are understood across genders.

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CHAPTER 1

INTRODUCTION

Psychopathy is a condition characterized by deficits in emotional processing, interpersonal relationships, and self-regulation, and it is considered among the best predictors of violence (Hare, 1991). Individuals with psychopathic tendencies generally engage in callous and manipulative behavior in the exploitation of others and exhibit a wide spectrum of antisocial and impulsive behaviors. Although psychopathy has historically been represented as a unitary construct, current conceptualizations of the disorder also support its heterogeneity in terms of primary and secondary variants (Blackburn, 1975; Hicks, Markon, Patrick, Krueger, & Newman, 2004; Skeem, Johansson, Andershed, Kerr, Eno, & Louden, 2007), as well as multiple underlying trait dimensions (Cooke & Michie, 2001; Hare, 2003; Patrick, Fowles, & Krueger, 2009). However, much of the literature informing the heterogeneity of psychopathy has predominantly focused on male populations (e.g., Hicks et al., 2004; Poythress et al., 2010; Swogger & Kosson, 2007), with a few exceptions (e.g., Hicks, Vaidyanathan, & Patrick, 2010; Vitale & Newman, 2001). Thus, manifestations of psychopathy in women are not fully understood.

While extensive research supports the diagnostic validity and reliability of the psychopathy construct in both men and women (Patrick, 1994; Salekin et al., 1997; Verona & Vitale, 2006), psychopathy has not been recognized as a diagnosable disorder since the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II; APA, 1968). Instead, the current version of the manual includes the diagnosis of Antisocial Personality Disorder (APD) – a disorder that focuses solely on criminal, impulsive, and aggressive behaviors (APA, 2000). Although the APD diagnosis was intended as a replacement for psychopathy, the

two disorders are not synonymous (Hare, Hart, & Harpur, 1991; Lykken, 1995; Patrick, 1994), as they evidence distinct emotional and cognitive correlates (e.g., Verona, Patrick, & Joiner, 2001; Verona, Sprague, & Sadeh, 2012). Accordingly, examining the nature of psychopathy is crucial in order to appropriately inform work on the classification and treatment of personality disorders across genders.

One important gap in the extant literature pertains to whether and to what extent psychopathic traits may manifest differentially as a function of gender. In particular, some theorists have argued that psychopathy represents a female phenotypic expression of borderline personality disorder (BPD) (Cale & Lilienfeld, 2002; Lilienfeld, 1992), although there has been debate regarding this issue. This debate is, in part, due to the admittedly sparse literature regarding the overlaps and distinctions between BPD and psychopathy among women (cf. Herpertz et al., 2001) and is further complicated by the disproportionate prevalence of psychopathy in men versus BPD in women (APA, 2000; Salekin et al., 1997). However, examining the relationship between BPD and psychopathy in both male and female samples is an important area of research, as these two disorders are associated with a constellation of similar symptoms (e.g., impulsivity, lack of empathy, manipulation, aggression), risk factors (e.g., childhood abuse, poor parental attachment; Gao, Raine, Chan, Venables, & Mednick, 2010; Miller, Dir, Gentile, Wilson, Pryor, & Campbell, 2010; Zanarini, 2000), and prevalence rates (e.g., 1-2% in the general population; Neumann & Hare, 2008; Oldham, 2004).

Accordingly, this paper comprises three studies that seek to advance the literature by examining the interrelationships between the psychopathy factors, BPD, and a broader emotional dysregulation construct with attention to potential gender differences. These three studies are organized around three major goals. First, Studies 1 and 2 examine whether secondary

psychopathic traits are more closely associated with BPD in women than in men, which would suggest that secondary psychopathy may reflect a female phenotypic expression of BPD (Goal 1). Second, the current paper also seeks to move towards a more trait-based approach in order to better understand the proposed relationship between BPD and secondary psychopathy. In the field of personality disorders, dimensional personality trait models have become increasingly prominent in informing how psychopathology is organized and conceptualized (e.g., Krueger & Eaton, 2010; Krueger & Markon, 2006; Skodol et al., 2011). Accordingly, Study 3 moves beyond the diagnosis of BPD and determines what specific traits or vulnerabilities may account for the theorized overlap between BPD and secondary psychopathy in women. Namely, Study 3 investigates how the broader construct of emotional dysregulation – which is thought to reflect the underlying pathology associated with BPD – relates to gender and psychopathic traits. To accomplish this goal, Study 3 first evaluates a theoretical model of emotional dysregulation, determines its relevance for men versus women, and clarifies how it relates to dimensional models of psychopathology (Goal 2). Study 3 subsequently examines whether the model of emotional dysregulation evaluated per Goal 2 may be phenotypically expressed in terms of secondary psychopathy among women (Goal 3).

Disaggregating Psychopathy

Psychopathy is a disorder characterized by two primary sets of traits: the first marked by interpersonal-affective deficits (referred to here as "Factor 1" or F1; shallow affect, lack of remorse, callousness, deceitfulness) and the second marked by impulsive-antisocial traits (referred to here as "Factor" 2 or F2; aggression, impulsivity, irresponsibility, antisociality) (Harpur, Hare, & Hakistan, 1989). Although a variety of typological theories exist regarding the heterogeneity of psychopathy, most common are those which have posited that the disorder can

be disaggregated into primary and secondary variants (Blackburn, 1975; Karpman, 1941; Lykken, 1995; Schmitt & Newman, 1999; for a review, see also Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003).[1] Primary psychopathy is theorized to be grounded in the aforementioned core affective and interpersonal deficits traditionally associated with the disorder (e.g., grandiosity, superficial charm, lack of remorse), as originally proposed by Cleckley (1941/1976). In contrast, the manipulative and callous traits present in secondary psychopathy are thought to arise indirectly as a means of coping with environmental stressors and are typically accompanied by emotional dysregulation (Karpman, 1941). As such, secondary psychopaths are typically characterized by impulsive-aggressive symptoms (Hicks et al., 2004) and high levels of neuroticism (Lykken, 1995). Secondary psychopathy is thought to best parallel the diagnosis of APD in current versions of the DSM, though the disorders are not identical.

Research indicates that the two factors of the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) – a widely accepted diagnostic tool in the field – may tap the distinguishing features of primary versus secondary psychopathy. That is, primary psychopathy is theoretically linked with correlates of PCL-R Factor 1 (e.g., emotional detachment, premeditated aggression, poor passive avoidance learning; Benning, Patrick, Salekin, & Leistico, 2005; Patrick, 1994; Newman & Schmitt, 1998), whereas secondary psychopathy is linked with those of PCL-R Factor 2 (e.g., executive functioning deficits, impulsivity, substance use problems; Morgan & Lilienfeld, 2000; Smith & Newman, 1990; Verona, Patrick, & Joiner, 2001). Although F1 and F2 demonstrate unique associations with primary and secondary psychopathy, respectively, the two psychopathy variants are – by definition – nonetheless characterized by high scores on *both*

[1] Although the two-factor model has largely dominated psychopathy research over the past several decades, factor analytic studies also provide evidence for the existence of three- (Cooke & Michie, 2001) and four-factor models (Hare, 2003). Both the three- and four-factor models disaggregate Factor 1 into two separate, but correlated, "Interpersonal" and "Affective" facets. In the three-factor model, the third factor is a comprised of an abbreviated version of Factor 2, which just includes items related to an impulsive and irresponsible lifestyle (while eliminating any items related to explicit antisocial behavior). The four-factor model, in contrast, retains the antisocial behavior items and splits Factor 2 into "Lifestyle" and "Antisocial" facets.

factors of the PCL-R. Thus, despite the validity and utility of the PCL-R in predicting recidivism and violence in forensic contexts, factor scores on the PCL-R alone cannot identify the etiological differences between primary versus secondary psychopathy.

Even though the PCL-R precludes etiological assumptions regarding the two psychopathy variants, theories describing different etiological pathways have helped to explain the development of F1 and F2 traits in primary versus secondary psychopathy. In particular, primary psychopaths are thought to be temperamentally unemotional as a result of fundamental deficits in fear (Fowles & Dindo, 2006; Patrick & Bernat, 2009), which facilitates their lack of moral conscience and makes them particularly suited for engaging in acts of premeditated violence (Lykken, 1995). In contrast, secondary psychopaths have a normal capacity for emotional experience (Hicks et al., 2010) and are thought to acquire the callous and unemotional traits associated with the disorder (i.e., F1 traits) as a means of coping with and/or adapting to environmental stressors (e.g., low socioeconomic status, childhood abuse; Karpman, 1941; Mealy, 1995; Porter, 1996). Thus, despite sharing similar phenotypic profiles, these variants of psychopathy can be distinguished on the basis of their personality structure and etiological underpinnings (e.g., Skeem et al., 2003). The distinction between these variants is supported by research that has shown differences in laboratory behavior among psychopaths scoring low versus high in anxiety (i.e., presumed to index primary and secondary variants, respectively), such that the former exhibits deficits in passive avoidance learning whereas the latter does not (Newman & Schmitt, 1998; Schmitt & Newman, 1999).

Associations between Secondary Psychopathy and BPD

It is important to make a distinction between these two variants when discussing the relationship between BPD and psychopathy, as it is the secondary variant (as opposed to the

primary variant) that more closely parallels the diagnosis of BPD in women. This differential distinction is supported by the fact that, of the two variants, secondary psychopaths are more impulsive, emotionally reactive, and "hot headed" (Karpman, 1948), whereas primary psychopaths exhibit behavior that is callous, goal-oriented, and premeditated (Skeem et al., 2003). Although it makes conceptual sense that the F2 traits associated with secondary psychopathy would relate to BPD – as evidenced by their parallels in impulsivity, affective instability, and reactive aggression – secondary psychopaths nonetheless exhibit both F1 and F2 psychopathy traits. It may appear counterintuitive that F1 traits would characterize BPD as well, given that F1 traits (i.e., callousness and deficits in emotional experience) bear poor resemblance to BPD, a disorder marked by extreme levels of emotionality. However, this paradox can be reconciled by considering the etiological differences in the development of F1 traits in primary versus secondary psychopathy. As with secondary psychopathy, it may be that BPD traits lead to manifestations of F1 traits (e.g., manipulation, lack of empathy) as a result of attempts to cope with the intense and variable emotions promoted by F2 traits.

For example, a woman with BPD who faces the prospect of being abandoned by her partner may become dysregulated and emotionally unstable upon hearing this possibility. In turn, she may engage in behavior towards her partner that is manipulative and callous (e.g., emotional blackmail, calculated physical assaults, purposeful infidelity) as a means of salvaging the relationship. In this respect, her manipulative and seemingly callous behavior – which resembles F1 traits – emerges in an attempt to cope (albeit dysfunctionally) with the intense and variable emotions promoted by her F2 traits. Indeed, recent empirical work on the "rejection-rage contingency" in BPD has demonstrated that the uncontrollable and intense rage characteristic of BPD is often elicited in response to perceived rejection (Berenson, Downey, Rafaeli, Coifman, &

Leventhal Paquin, 2011). Although this rage is initially triggered by the emotionally dysregulated (i.e., F2) traits that are characteristic of BPD, it subsequently prompts what could be viewed as "psychopathic-like" (i.e., F1) behavior. This inability to self-regulate following perceived rejection is not surprising, given the centrality of interpersonal dynamics to the borderline construct.

Accordingly, one view advanced in the present paper is that the interplay between the two psychopathy factors may be associated with BPD, at least among women who presumably exhibit the secondary variant of psychopathy. Indeed, research conducted on female psychopaths indicates that the combination of interpersonal-affective deficits and impulsive-antisocial traits is associated with problems in affective regulation, including intense dysphoria, self-mutilation, binge-eating, and property damage (Coid, 1993). Further, psychopathy-factor level interactions have been found to differentially predict both self- and other-directed violence, such that the effect of F2 traits on violence is intensified at higher levels of F1 traits (Verona, Sprague, & Javdani, in press; Walsh & Kosson, 2008).

The notion that BPD may phenotypically manifest in terms of secondary psychopathy among women is also supported by studies that have found evidence of familial clustering and a history of childhood victimization among individuals with antisocial, psychopathic, and borderline personality traits. For example, relatives of individuals diagnosed with BPD are at a greater risk to develop APD (i.e., considered to parallel the secondary variant of psychopathy) with prevalence rates that are up to four times greater than those observed in the general population (Cadoret, 1978; White, Gunderson, Zanarini, & Hudson, 2003; Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1988). Moreover, an abundance of research suggests that childhood abuse is associated with increased risk for developing both BPD and psychopathy later

in life. For example, individuals who were physically and/or sexually abused as children score higher on the PCL-R than their non-victimized counterparts (Weiler & Widom, 1996); however, this association is specific to F2 psychopathy traits and not F1 traits (Poythress, Skeem & Lilienfeld, 2006; Verona, Patrick, & Hicks, 2005). The relationship between child abuse and psychopathy also seems particularly salient with regard to secondary psychopaths, as high-anxious (i.e., secondary) psychopaths report a greater history of abuse relative to low-anxious (i.e., primary) psychopaths (Kimonis, Skeem, Cauffman, & Dmitrieva, 2011). Similarly, childhood trauma has long been hypothesized as a risk factor in the development of BPD (e.g., Gunderson, 2001; Linehan, 1993), as individuals with the disorder consistently report higher levels of childhood abuse, particularly that which is sexual in nature (Soloff, Lynch, & Kelly, 2002; Widom, Czaja, & Paris, 2009; Zanarini, 2000).

Despite the degree of overlap between these two disorders, BPD and secondary psychopathy are still considered conceptually distinct and exhibit different prevalence rates across genders, particularly in clinical samples (i.e., BPD is more common among women and secondary psychopathy among men; APA, 2000; Salekin et al., 1997; Zanarini et al., 1998, 2003). For example, although both disorders are characterized by problems in regulating affect and behavior, there are various differences in the manifestation of these problems – such as greater distress and suicide risk in BPD and greater violence and criminality in secondary psychopathy (Fossati et al., 2004; Raine, 1993; Walters & Heilbrun, 2009). BPD has also been traditionally associated with more pronounced reactivity and disruptions in interpersonal relationships than psychopathy (e.g., frantic efforts to avoid abandonment, unstable relationships that waver between idealization and devaluation) (APA, 2000).

Accordingly, it may be that conceptualizations of psychopathy are characterized by an overreliance on masculine experiences and expressions of the disorder (e.g., grandiosity, dominance, other-directed violence) and have failed to adequately capture experiences that best-represent manifestations of psychopathy in women. Examining the overlap and distinctions between BPD and psychopathy traits is thus an important area of research, as it can impact the ways in which personality disorders are organized and conceptualized in future versions of the DSM, as well as provide information about gender differences in symptom manifestations. Furthermore, recognizing differential overlap in the assessment and diagnosis of psychopathy and BPD in women versus men also bears significant implications for both clinical and legal practice, as gendered expressions of the disorders are likely to differ in terms of violence risk and treatment responsivity (Nicholls & Petrila, 2005).[2]

The Construct of Emotional Dysregulation: Associations with BPD, Psychopathy, and Gender

The present research attempts to clarify associations between BPD and psychopathic traits across men and women. However, another goal is to move beyond the diagnosis of BPD in order to capture the putative pathology associated with this disorder and how it relates to psychopathy. Indeed, BPD is a heterogeneous disorder that has often been criticized as a "catch-all" construct that lacks specificity. As it is currently defined in the DSM (APA, 2000), BPD is a severe psychiatric disorder characterized by affective instability, disruptions in interpersonal

[2] Although psychopathy and BPD represent relatively masculinized and feminized disorders, respectively, research using item response theory generally does not support the notion that the measures used to assess these constructs function differently across genders. With regard to psychopathy, studies that have compared the item functioning of the PCL-R in men versus women generally find evidence for measurement invariance. Specifically, although certain items on the PCL-R demonstrate somewhat greater differential item functioning in female versus male offenders, these effects are primarily attributable to items that tap into the "Antisocial" facet of psychopathy (Bolt, Hare, Vitale, & Newman, 2004). That is, the antisocial items tend to provide less information in women, due to unintended measurement of certain nuisance variables. However, these effects are actually quite small and the PCL-R as a whole performs similarly in men versus women (Bolt et al., 2004). With regard to BPD, there exist only a few studies explicitly examining differential item functioning of the construct across genders. However, a recent study found evidence for strict measurement invariance of the PAI-BOR with respect to gender in a representative sample of 6,838 individuals (De Moor, Distel, Trull, & Boomsma, 2009). Though a second study that examined gender differences in the DSM-IV criteria for BPD did find evidence of measurement variance, this non-equivalence was accounted for by only 2 of the 9 criteria for the disorder. Namely, men were found to exhibit higher levels of impulsivity and women higher levels of affective instability (Aggen, Neale, Røysamb, Reichborn-Kjennerud, & Kendler, 2009). Thus, while there is some evidence for differential item functioning of the DSM-IV criteria for BPD, they only appear to be specific to a subset of criteria. Moreover, these differences do not seem as pronounced in self-report measures, such as the PAI-BOR.

relationships, unstable self-image, and poor impulse control. Although some researchers suggest that impulsivity or disinhibition is the central feature of BPD (e.g., Zanarini, 1993), there is growing evidence that affective instability seems to drive problems with impulse control in BPD (Selby, Anestis, Bender, & Joiner, 2009; Zittel, Bradley, & Westen, 2006). Thus, it is contended here that the underlying cause of BPD involves affect-related problems in the regulation of behavior, manifestations of which are included in the current diagnostic criteria for the disorder (e.g., frantic efforts to avoid abandonment, interpersonal difficulties due to marked reactivity of mood, and recurrent suicidal behavior; Koenigsberg et al., 2001; Putnam & Silk, 2005).

In light of such evidence, some researchers have argued that a more accurate descriptor of BPD is "emotional regulation disorder" or "emotional dysregulation disorder" (e.g., Gunderson & Hoffman, 2005), as emotion dysregulation is thought to produce the symptoms of BPD. Accordingly, the current investigation seeks to consider the broader construct of emotional dysregulation in relation to gender and psychopathic traits. Specifically, if BPD does in fact manifest in terms of secondary psychopathy in women, it is likely that emotion dysregulation in general can also manifest as secondary psychopathy in women. In other words, emotional dysregulation may represent a latent vulnerability for both disorders. Such an investigation is important in moving towards more empirically-derived constructs that may best characterize a constellation of problematic behaviors in men and women, rather than solely relying on traditional diagnoses.

While there are various models of emotion regulation (e.g., Campos, Frankel, & Camras, 2004; Cichetti, Ackerman, & Izard, 1995; Linehan, 1993; Thompson, 1994), one popularly used model is that proposed by Gross (1998), wherein emotion regulation is defined as the processes by which individuals influence the experience, expression, or physiology of their emotions. In

other words, emotion regulation reflects the influence that individuals have on what emotions they experience, how they experience them, and when they experience them. Emotional *dysregulation* is conceptualized here as the failure to effectively modulate one's affective state, which causes emotions to spiral out of control and interfere with rational judgment and reasoning (Linehan & Heard, 1992; Shedler & Westen, 2004). Thus, the current proposal is that the inability to engage in emotional regulation processes is associated with subsequent breakdowns in inhibitory control. Although emotional dysregulation can be considered an internally experienced state, it is behaviorally manifested through a variety of maladaptive coping strategies, including reactive aggression, recurrent suicidal ideation, and self-mutilation (Nolen-Hoeksema, Stice, Wade, Bohon, 2007; Selby, Anestis, & Joiner, 2008; Selby et al., 2009). Although maladaptive, such strategies have been found to provide individuals with temporary emotional relief, as they serve as means of escaping unwanted and intolerable emotional distress (Brown, Comtois & Linehan, 2002; Holm & Severinsson, 2008; Yen et al., 2002).

Importantly, evidence suggests that emotional dysregulation can – and often does – manifest differently in men versus women. For example, findings across the literature suggest that women are more likely to express their dysregulated emotions through internalizing, self-damaging behaviors (e.g., depression, self-mutilation), whereas men are more likely to do so through externalizing behaviors (e.g., antisocial behaviors, aggression) (James & Taylor, 2007; Taylor, 2005; Verona & Kilmer, 2007). Furthermore, compared to men, women more often engage in substance use as a means of coping with such psychological distress, both with regard to alcohol (King, Bernardy, & Hauner, 2003) and illicit drugs (Tu, Ratner, & Johnson, 2008), though men nonetheless demonstrate higher prevalence rates of substance use (SAMHSA, 2007). Recent evidence also suggests that, in contrast to other-directed violence, self-directed violence

(e.g., suicide attempts, self-harm) may reflect a specific manifestation of hostile traits in women (Sadeh, Javdani, Finy, & Verona, 2011). These gender differences in the manifestation of dysregulated tendencies can be, in part, explained by socialization processes that condone and often even encourage men to use other-directed violence as a means of expressing their anger (e.g., Eagly & Wood, 1999; Schwartz & DeKeseredy, 2000). In contrast, women are discouraged from such behavior and may thus learn to direct their hostility inwards, consequently increasing the risk of self-harm and suicide. This link between hostility and self-directed violence among women is consistent with models positing that depression and suicidality reflect aggression that is directed inward (Shneidman, 1969).

Moreover, the situational context in which men and women commit violence has been found to differ drastically. Compared to men, women are likely to manifest violent behavior within emotional or relational contexts (Robbins, Monahan, & Silver, 2003). These gender differences can be explained from both an evolutionary and socio-structural standpoint. First, work in the area of evolutionary psychology suggests that women's proclivity towards relationships and nurturing evolved from a maternal standpoint. Namely, in order to protect offspring and increase their probability of surviving, women developed an evolutionarily adaptive "attachment-caregiving system" (Taylor et al., 2000). This attachment-caregiving system served to promote women's disproportionate sensitivity to relational contexts (Eagly & Wood, 1999; Wood & Eagly, 2002; Taylor et al., 2000), thus becoming a central outlet in which their violence emerges. Another reason why women's violence may manifest within relational contexts lies within social structural theory. In particular, societal gender roles dictate different responsibilities that men versus women are expected to assume. In the current industrial society, women are still more likely than men to assume a traditional domestic role (e.g., homemaker,

caretaker), while men are more likely to assume the head household role and participate in the paid work force (Reskin & Padavic, 1994; Shelton & John, 1996). As a result of these societally proscribed gender roles, the situational context in which women assert their externalizing tendencies is often limited within the context of the home or relationships.

Moreover, the apparent documented gender differences in aggression – which suggest that men are more aggressive than women – are likely a result of the way in which aggression is often operationalized in research (Eagly & Steffen, 1986; Maccoby & Jacklin, 1980; Moffitt, Caspi, Rutter, & Silva, 2001). Most research has focused on overt forms of aggressive behavior (e.g., physical aggression) and has tended to exclude measures of covert or non-physical aggression. This is problematic for the assessment of aggression across genders, since women generally tend to engage more in the latter types of aggression, particularly in the form of relational aggression (Archer & Coyne, 2005). This form of aggression involves manipulating another person's social network in order to damage their interpersonal relationships, which is often accomplished through actions such as spreading rumors, refusing friendships, ostracizing, and teasing (Archer & Coyne, 2005; Richardson & Hammock, 2007; Werner & Crick, 1999). In contrast to physical aggression, relational aggression appears to be a more socially acceptable means by which women can express aggressive tendencies (Brown, 2003). Moreover, it may reflect a different behavioral manifestation of antisocial personality characteristics (Verona & Vitale, 2006).

Such evidence regarding the differential symptom expression of emotional dysregulation across genders is particularly salient, given the fact that psychopathy and BPD are predominantly male and female diagnoses, respectively (APA, 2000). In particular, it may help explain why women with BPD often experience internalizing forms of psychopathology (e.g., depression,

anxiety), whereas psychopathic men are more prone to externalizing-related outcomes (e.g., substance use, antisocial behavior; Bloningen, Hicks, Krueger, Patrick, & Iacono, 2005). Importantly, though, BPD women with severe forms of emotional dysregulation often exhibit similar, externalizing behavioral profiles as those found in men, including problems with substance use and impulsive violence (Casillas & Clark, 2002; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). Indeed, the above evidence suggests that emotional dysregulation in women can, in fact, manifest in terms of externalizing behaviors analogous to those exhibited by men, albeit in a manner that is often unrecognized as externalizing per se (e.g., non-physical or relational aggression).

BPD and Emotional Dysregulation: Relationships with Established Dimensions of Psychopathology

The fact that emotional dysregulation shows associations with both internalizing and externalizing behaviors suggests that it straddles both spectrums of the dimensional-hierarchical model of psychopathology proposed by Krueger and colleagues (e.g., Krueger, 1999; Krueger, McGue, & Iacono, 2001). This notion is supported by research regarding the multifaceted nature of BPD, a disorder that is presumed to reflect core problems in emotional regulation. Specifically, recent studies using confirmatory factor analysis (e.g., Eaton et al., 2011; James & Taylor, 2008) have found that BPD demonstrates substantial commonalities with disorders that fall within the externalizing spectrum (e.g., APD, substance use disorders; Becker, Grilo, Edell, & McGlashan, 2000; Taylor, 2005; Trull et al., 2000), as well as those that fall within the anxious-misery subfactor[3] of the internalizing spectrum (e.g., major depressive disorder,

[3] Although research regarding the higher-order structure of mental disorders supports the existence of two broad internalizing and externalizing factors, evidence suggests that the internalizing dimension further comprises two distinct subfactors. The "anxious-misery" subfactor represents disorders that are characterized by sadness and anxious apprehension (e.g., major depressive disorder and generalized anxiety disorder), whereas the "fear" subfactor represents disorders characterized by phobic avoidance and anxious arousal (e.g., panic disorder and specific phobias) (Krueger, 1999; Krueger & Markon, 2006).

dysthmia, generalized anxiety disorder; McGlashan et al., 2000; Perugi, Toni, Travierson, & Akiskal, 2003; Zittel & Westen, 2005).

Although related to both the internalizing and externalizing spectrums, the definition of emotional dysregulation proposed here suggests that the construct is nonetheless not fully captured by either. For example, internalizing disorders are primarily characterized by high levels of neuroticism, which reflects the tendency to experience negative emotional states, such as sadness, guilt, or anxiety (Watson & Clark, 1984; Tellegen, 1985). The present paper proposes that emotional dysregulation is not synonymous with neuroticism – though they do exhibit a high degree of overlap (Glenn & Klonksy, 2009; Markon, Krueger, & Watson, 2005; Miller & Pilkonis). Namely, emotional dysregulation as it is defined here additionally incorporates aspects of aggression, hostility, and vindictiveness – similar to the construct of negative emotionality proposed by Tellegen (1985). Thus, in addition to internalizing behaviors (e.g., dysphoria, feelings of worthlessness), the present conceptualization of emotional dysregulation is likely to be associated with externalizing outcomes as well (e.g., violence, impulse-control problems).

However, emotional dysregulation also appears to represent a process that, although related, is distinct from that of the externalizing spectrum. Externalizing disorders are characterized by a shared dispositional vulnerability towards disinhibition or lack of constraint (Gorenstein & Newman, 1980; Krueger et al., 2005). While failures of inhibitory control also comprise the proposed construct of emotional dysregulation, inherent in the definition proposed here is the notion that lack of control over one's emotional state leads to engagement in disinhibited behaviors. In other words, emotional reactivity interferes with the ability to engage in appropriate behavioral control or can even precipitate impulsive or risky behaviors (Cyders & Smith, 2007, 2008; Sprague & Verona, 2010; Verona, Sadeh, & Curtin, 2009). This

conceptualization is in contrast to the externalizing dimension, which does not necessarily index disinhibitory behaviors that are emotionally instigated in nature. Therefore, while emotional dysregulation includes components of both the internalizing and externalizing dimensions, it can be distinguished from these two dimensions.

The ambiguity surrounding the relationship between dimensions of psychopathology and emotional dysregulation is further complicated by the fact that potential gender differences may exist in terms of which models of dysregulation provide the best representational fit. Such gender differences are likely, given evidence of differential symptom expression of dysregulation across the genders (i.e., emotional dysregulation can lead to both internalizing and externalizing behavioral profiles in women, whereas men most consistently evidence only the latter behavioral profile; Blonigen et al., 2005; Chaplin, Kwangik, Bergquist, & Sinha, 2008; Kramer, Krueger, & Hicks, 2008). The lack of clarity regarding this subject prompts the need for additional research to evaluate the latent structure of emotional dysregulation and determine its relevance for men versus women, as well as clarify how it relates to existing dimensions of psychopathology (e.g., internalizing and externalizing).

Summary

Current findings across the literature provide some evidence for an association between BPD and secondary psychopathy, particularly among women (e.g., Cale & Lilienfeld, 2002; Gunderson, 1994; Lilienfeld, 1992; Miller et al., 2011; Paris, 1997). Despite the fact that existing work is largely theoretical – as opposed to empirical – in nature, this has nonetheless incited some theorists to maintain that BPD and psychopathy may manifest in terms of one another. As it is viewed in the present paper, the observed overlap between BPD and psychopathy among women seems to suggest that both disorders are gendered manifestations of the same

dispositional vulnerability. However, there is currently a lack of evidence regarding the specific nature of the common vulnerability that may underlie both disorders. In the current paper, it is argued that the vulnerability that promotes BPD (i.e., emotional dysregulation) may very well represent the same vulnerability that promotes secondary psychopathy in women. Given this, if psychopathy does in fact represent a phenotypic expression of BPD, then psychopathy also likely represents a phenotypic expression of the pathology that underlies BPD: emotional dysregulation. If this is the case, then it may be that both BPD and psychopathy are promoted by the same vulnerability of emotional dysregulation. Examining the generalizability of the BPD-secondary psychopathy relationship to the broader construct of emotional dysregulation is important for informing work on dimensional conceptualizations of personality psychopathology, per several of the proposed revisions in DSM-5 (APA, 2010).

The Present Studies

The present project seeks to provide a more systematic investigation into the associations between BPD, psychopathy, and emotional dysregulation in women and men across three separate studies. The proposed research is organized around the following specific goals and predictions:

Goal #1: This investigation attempts to uncover the overlaps and distinctions between psychopathic and borderline traits in two independent samples: a non-clinical college sample of both genders (Study 1) and a clinical forensic sample of women (Study 2). Although prior research has found evidence that BPD is more strongly related to secondary psychopathic traits (as represented by F2 traits; Lilienfeld & Hess, 2001), such research has failed to disentangle any potential gender differences that characterize this relationship. Thus, Study 1 extends the current literature by determining whether gender moderates the relationship between psychopathic

characteristics and BPD symptoms, such that F2 traits (as opposed to F1 traits) are more strongly associated with BPD symptoms in women than in men. This would be consistent with the theorized overlap between BPD and secondary psychopathy in women. Furthermore, although BPD may parallel secondary psychopathy more strongly than primary psychopathy, psychopathy as a construct is nonetheless defined as being high in *both* F1 and F2 traits. Given this, analyses also examined whether the interaction of these two psychopathy factors is associated with BPD (Studies 1 and 2), as well as whether any observed psychopathy-factor level interactions (i.e., F1 × F2) were further moderated by gender (Study 1). Given prior work that has found evidence of a F1 × F2 interaction in predicting other- and self-directed violence – such that the effect of F2 is intensified at higher levels of F1 (Verona, Sprague, & Javdani, in press; Walsh & Kosson, 2008) – one hypothesis is that a similar pattern of results will emerge for the relationship between the psychopathy factors and BPD, particularly among women.

Goal #2: The proposed project also seeks to validate the present conceptualization of emotional dysregulation and clarify how the construct of emotional dysregulation is best represented in men versus women (Study 3). Accordingly, different dimensional models were evaluated to determine if emotional dysregulation is best represented as a: (1) two-factor hierarchical model in which the subjective experience and behaviors associated with emotional dysregulation are represented by the higher-order factor of emotional dysregulation; (2) developmental model in which the experience of dysregulation is proposed to lead to the behaviors associated with it; (3) two-factor model comprised of the experiences and behaviors associated with emotional dysregulation; and (4) one-factor model that does not differentiate between experiences and behaviors. Multigroup analyses examined gender differences in the fit of these various models. Given evidence for gender differences in the behavioral expression of

emotional dysregulation (e.g., Chaplin et al., 2008; Kramer et al., 2008), these four competing models were fitted with several indicators that may best capture the experiences and manifestation of dysregulation in *both* men and women. These indicators include mood lability and hostility (to capture the subjective experience of dysregulation), as well as suicide-related behaviors, reactivity in relationships, and emotional aggression (to capture the manifestation of dysregulation).

Although there are no specific hypotheses as to which model will provide the best fit to the construct of emotional dysregulation, there are nonetheless several hypotheses regarding the indicators used to fit these competing models. Namely, it is expected that certain indicators will demonstrate mean-level differences across genders, potentially resulting in measurement non-equivalence. First, given that female dysregulation is often embedded in emotional or relational contexts (e.g., Miller & Meloy, 2006), it is expected that women will be more likely to exhibit greater levels of "reactivity in relationships" than men. Similarly, research finds higher levels of "suicide-related behaviors" in women as opposed to men, including with regard to suicide attempts and non-suicidal self-harm (Bridge et al., 2006; Ross & Heath, 2002). Thus, if non-equivalence occurs it would likely result from mean-level differences in "reactivity in relationships" and "suicide-related behaviors", rather than their functional relationship with emotional dysregulation. With regard to emotional aggression, hostility, and mood lability, it is expected that there will be equivalence across genders.

Finally, to determine how the proposed construct of emotional dysregulation corresponds to existing psychopathology constructs, additional correlational analyses evaluated the relationship between the best fitting model of emotional dysregulation and indicators of the INT and EXT dimensions. Such work is important, given research suggesting that current

dimensional conceptualizations of psychopathology do not represent emotional dysregulation on any one dimension (e.g., James & Taylor, 2008), possibly owing to gender differences in the manifestations of dysregulation. Thus, it is expected that emotional dysregulation in men will be more strongly related to indicators that represent the current EXT factor, whereas in women it will be related to indicators of both the INT and EXT factors. However, more specific relationships with INT and EXT are expected among women. Namely, it may be that the relationship between emotional dysregulation and INT in women is only significant for indicators of the anxious-misery subfactor (e.g., Major Depressive Disorder, Generalized Anxiety Disorder), as opposed to the fear subfactor (e.g., anxious arousal or fear disorders). Further, given evidence that women are likely to engage in substance use, but not necessarily antisocial behavior, as a means of coping with psychological distress (e.g., King et al., 2003), it is expected that emotional dysregulation in women will demonstrate stronger associations with EXT variables related to substance dependence (e.g., alcohol, drug) as opposed to antisocial behavior (e.g., APD, conduct disorder).

Goal #3: If Studies 1 and 2 find evidence supporting the notion that secondary psychopathy is in fact a female phenotypic-expression of BPD, it is likely that emotional dysregulation *in general* can also manifest in terms of secondary psychopathy in women. Given this, the purpose of Study 3 was also to extend the results of Studies 1 and 2 beyond the construct of BPD. Specifically, analyses examined whether the best-fitting model of emotional dysregulation established per Goal #2 is phenotypically manifested in terms of F1 and F2 traits, and/or their interaction, in women versus men. Moreover, given that childhood victimization is a risk factor that has been heavily implicated in the development of both psychopathy (Gao et al., 2010) and emotional dysregulation (i.e., typically as it is associated with BPD; Linehan, 1993), it

is possible that the relationship between these two syndromes may be accounted for by a history of childhood abuse. To examine this possibility, supplementary analyses were conducted with childhood abuse included in the above model.

CHAPTER 2

GOAL #1: ASSOCIATIONS BETWEEN GENDER, PSYCHOPATHY FACTORS, AND BORDERLINE PERSONALITY DISORDER

Studies 1 and 2 address Goal #1 using the methods described below. Specifically, these studies attempt to clarify the theorized overlap between psychopathic traits and borderline personality and, moreover, examine any potential moderating effects of gender in this association.

Study 1

Method

Participants

Participants consisted of 318 undergraduate students (51% female) enrolled at a large Midwestern university (see Sprague & Verona, 2010). The sample was predominantly between the ages of 18 and 21 (90%), and most identified as Caucasian (63%), followed by Asian (9%), Hispanic (8%), other (5%), and African-American (3%). Participants provided informed consent, as per IRB-approved procedures, and received course credit in exchange for participation.

Psychopathic Personality Measures

The Psychopathic Personality Inventory, Short Form (PPI-S; Lilienfeld & Andrews, 1996) is a 56-item questionnaire designed to measure psychopathic characteristics in noncriminal populations. The questionnaire measures global psychopathy and also contains eight factor analytically derived subscales, seven of which can be grouped to form two factors that reflect F1 (“fearless-dominance” scale) and F2 (“antisocial-impulsivity” scale) (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). One subscale, coldheartedness, does not load strongly on either

factor. Participants indicate to what extent each statement applies to them on a 4-point scale (1 = *false* to 4 = *true*).

The Self-Report Psychopathy Scale (SRP-II; Hare, Hemphill, & Harpur, 1989) is a well-validated self-report measure of psychopathy that consists of interpersonal-affective and social-deviance scales (intended to reflect the F1 and F2 facets of psychopathy, respectively). The SRP-II contains 60 items, and participants indicate how much they agree or disagree with each statement, with responses ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). The SRP-II has been found to correlate at .54 with the PCL-R in forensic populations (Hare, 1991). Forth and colleagues (1996) also found modest correlations between the PCL-R and the SRP-II in a sample of college students (r = .62 in men and r = .55 in women).

Borderline Personality Trait Measures

The Borderline Features Scale of the Personality Assessment Inventory (PAI-BOR; Morey, 1991) is a measure of borderline traits, which has been used extensively in studies of BPD in both community and clinical samples. The PAI-BOR contains 24 items that assess four subscales of borderline pathology: affective instability, identity problems, negative relationships, and self-harm. These items are rated on a 4-point scale, and possible scores range from 0 to 72. The PAI-BOR exhibits acceptable reliability and validity (Morey, 1991, 1996; Trull, 1995).

The Short Coolidge Axis II Inventory (SCATI; Coolidge, 2001; Coolidge, Segal, Cahill, & Simenson, 2010) is a short version of the original Coolidge Axis II Inventory (CATI; Coolidge, 1993). The 5-item Borderline scale of the SCATI was used in this study. A normative study that examined the psychometric properties of the SCATI found that it retained many of the same properties as the original measure and demonstrated good internal reliability and validity (Watson & Sinha, 2007).

Composite Measures of Psychopathic and Borderline Traits

In order to more reliably index the constructs of interest, composite scores of psychopathic personality facets and borderline personality traits were calculated by standardizing and averaging together individual factor scores on the PPI-S and SRP-II (composite F1 and F2 psychopathic personality traits, respectively) and the PAI-BOR and SCATI (composite borderline personality) (cf. Sprague & Verona, 2010). The composite F1 and F2 psychopathic personality scores demonstrated high internal consistency in the present sample for both men (α = .83 for F1 and .81 for F2) and women (α = .86 for F1 and .86 for F2). The composite measure of borderline personality also demonstrated high internal consistency across men (α = .86) and women (α = .91).

Data Analytic Plan

Hierarchical regression analyses were conducted to examine the independent and interactive effects of gender and continuous psychopathy factor scores (F1 and F2) in predicting borderline traits. In order to investigate potential factor-level interactions and gender moderation, the main effects associated with gender and the two psychopathy factor scores were entered into the first step of analyses, followed by their two-way interactions in the second step, and the three-way F1 × F2 × gender interaction in the third step. All independent variables were standardized prior to the creation of the interaction terms, and any significant interactions were decomposed per the procedures recommended by Aiken and West (1991).

According to Cohen (1992), in hierarchical regression, an f^2 of .02 is considered a small effect size, .15 a medium effect size, and .35 a large effect size. Although small to medium effect sizes are often considered insignificant in statistical terms, such effects can nonetheless have significant practical implications in the real world. For example, while secondary psychopathy

and BPD are both associated with significant levels of distress and impairments in functioning, gendered expressions of the disorders are likely to differ in terms of symptom manifestations, treatment outcomes, and violence risk. Thus, recognizing gender differences in these disorders is useful in enhancing diagnostic efficiency and facilitating the development of more targeted interventions. Accordingly, for the purposes of the present study, even a small to medium effect size (i.e., approximately .08) for an interaction term would be considered important. According to the methods suggested by Cohen (1992) and Aiken and West (1991), a sample size of approximately 224 is necessary to detect such an effect size at 80% power for an alpha of .05 for an interaction term in multiple regression analyses. This indicates sufficient power to detect an effect in the present study with a sample of 318.

Results

Descriptive Statistics

Table 1 presents the means, standard deviations, and range of scores for the psychopathic and borderline personality trait measures separately for men and women, as well as gender differences in mean levels. As would be expected based on the literature, a pattern of findings emerged where men scored higher on psychopathy measures and women scored higher on features of BPD. Of note, the descriptive statistics in this sample also adequately parallel those that have been found in other college, community, and forensic samples using the same measures.[4]

[4] With regard to psychopathic traits in Study 1, the descriptive statistics reported here are comparable to those found in other college samples. On the SRP-II, this includes both F1 scores (M = 15.5 [SD = 4.8] for Hicklin & Widiger, 2005; and M = 24.17 [SD = 4.33] for Lilienfeld & Hess, 2001), as well as F2 scores (M = 20.9 [SD = 8.5] for Hicklin & Widiger, 2005; and M = 31.87 [SD = 7.81] for Lilienfeld & Hess, 2001). On the PPI-S, this also includes both F1 and F2 scores (M = 78.08 [SD = 13.44] and M = 40.71 [SD = 7.97], respectively; Lilienfeld & Hess, 2001). Additionally, participants' mean scores on these same scales in Study 1 were comparable to those obtained in a forensic population by Cale and Lilienfeld on F1 (2006; M = 35.84 [SD = 7.99] for the SRP-II; and M = 85.16 [SD = 10.31] for the PPI-S) and F2 (2006; M = 44.94 [SD = 15.22] for the SRP-II; and M = 47.07 [SD = 8.27] for the PPI-S). With regard to borderline traits, participants' scores in Study 1 also reflect those found in other college and community samples which have used the PAI-BOR (M = 26.71 [SD = 14.70] for Gardner & Qualter, 2009; and M = 27.23 [SD = 10.87] for Trull, 1995), as well as the SCATI-BOR (M = 9.67 [SD = 2.64] for Schmeelk, Sylvers, & Lilienfeld, 2008; and M = 8.77 [SD = 2.95] for Sylvers, Brubaker, Alden, Brennan, & Lilienfeld, 2008). Although mean scores on the PAI-BOR in forensic populations (M = 54.76 [SD

Regression Analyses

Table 2 depicts the analyses of psychopathic personality factors and gender in predicting borderline personality traits. Analyses revealed a main effect of gender (β = .19, p < .001), such that women showed stronger associations with borderline traits than men. F1 and F2 also predicted borderline traits in expected directions, with F1 exhibiting a negative relationship and F2 exhibiting a positive relationship with borderline traits (βs = -.34 and .68, respectively, *p*s < .05). There was also F2 × Gender interaction (β = .36, $p = .03$), indicating that, as expected, F2 is more predictive of borderline traits in women than men. However, these effects were qualified by a F1 × F2 × Gender interaction (β = .31, $p = .03$, $f^2 = .02$). Separate analyses conducted within each gender revealed an interaction between F1 and F2 in predicting borderline traits among women (β = .11, $p = .05$) but not men (β = -.08, $p = .25$); that is, the relationship between F2 and borderline traits differed across levels of F1 in women but not men. In order to further examine this interaction, simple slope tests were conducted within each gender to analyze the effect of F2 at high and low levels of F1 (i.e., ±1 *SD* from the mean). Decomposition of this interaction indicated that the relationship between F2 and borderline traits was stronger among women who were high in F1 traits (β = .80, $p < .001$), albeit still significant among those low in F1 traits (β = .63, $p = .001$). In contrast, the relationship between F2 and borderline traits among men did not differ significantly as a function of F1 scores (βs = .53 and .66 for men low and high in F1, respectively, *p*s < .001). This interaction is depicted in Figure 1.

Goal #1 Discussion (Study 1)

As predicted, the results of Study 1 indicate that psychopathic traits interact with gender to predict borderline traits. Namely, the relationship between impulsive-antisocial traits (F2) and

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= 11.84]; Douglas, Guy, Edens, Boer, & Hamilton, 2007) and psychiatric inpatients (*M* = 45.89 [*SD* = 6.55]; Evershed et al., 2003) are higher than those in the Study 1 college sample, this is not surprising given the differentiation between clinical and nonclinical populations.

borderline personality was much stronger among women high on affective-interpersonal deficits (F1), although this is not the case for men. This suggests that the interaction of the two psychopathic trait factors increases risk for borderline personality among women but not men. Rather, in men, borderline personality traits are solely associated with F2 traits and do not vary as a function of F1 psychopathic traits. Indeed, there is evidence to suggest that F1 psychopathic traits may actually be protective against emotional dysregulation in men (Verona, Patrick, & Joiner, 2001; Verona, Sprague, & Javdani, in press). Although the findings of Study 1 provide preliminary evidence for the notion that secondary psychopathy may reflect a female phenotypic expression of borderline personality traits, they must be considered in light of some limitations. In particular, these results are reliant on self-report based measures of psychopathology distributed to a relatively homogenous population of college students. This limits not only the ability to detect a broad range of symptom severity and psychopathic traits but our ability to generalize to other samples as well. Thus, the aim of Study 2 was to extend the validity and generalizability of findings for females in particular by replicating the results in a forensic sample of women and using structured diagnostic interviews.

Study 2

Method

Participants

The sample consisted of 488 women incarcerated in an all female maximum-security prison in Wisconsin. Participants were between the ages of 18 and 43 (M = 29.38, SD = 6.51) and identified either as Caucasian (n = 267; 55%) or African-American (n = 214; 44%). Seven participants did not have information regarding ethnicity. In terms of education level, the majority of the sample reported completing at least some high school education (n = 440; 86%),

and approximately half reported obtaining their GED (n = 202; 42%). All participants received the elements of consent in both verbal and written form and were informed that participation in the project would have no effect on their status within the correctional system. IRB approval was obtained for all aspects of the study.

Psychopathy Measure

Data collected from a semi-structured interview and prison records were used to assess for psychopathy via the PCL-R (Hare, 2003). The PCL-R is comprised of 20 items rated on a three-point scale (0 = *Not at all characteristic*; 1 = *Moderately characteristic*; 2 = *Extremely characteristic*). Research indicates that these items can reliably be summed to reflect the two separate, but correlated, psychopathy factors: F1 and F2 (Hare et al., 1990; Harpur, Hakstian, & Hare, 1988; Harpur, Hare, & Hakstian, 1989). Accordingly, separate factor scores were calculated to reflect these two dimensions of psychopathy. Individuals with a PCL-R total of 30 or above (on a 40 point scale) are classified as psychopathic. Recent research has also validated a multidimensional classification (Blackburn & Coid, 1998; Miller et al., 2001; Lynam and Widiger, 2007; Widiger, 1998), supporting the use of separate factors. The PCL-R has been established as a well-validated and reliable measure in relevant samples (e.g., Hare, 1991, 1996), including female prisoners (Salekin et al, 1997; Vitale & Newman, 2001).

Borderline Personality Disorder Measure

BPD was assessed via the Diagnostic Interview for Borderline Personality Disorder-Revised (DIB-R; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989), which is a semi-structured interview that parallels the DSM-IV criteria for BPD (Blais, Hilesenroth, & Castlebury, 1997; Moriya, Miyake, Minakawa, Ikuta, & Nishizono-Maher, 1993). The DIB-R consists of 186 questions, from which raters obtain the necessary information to rate 22 summary

statements that are central to BPD. These 22 summary statements are used to yield scaled section scores (Affect, Cognition, Impulse Action Patterns, and Interpersonal Relationships), which, in turn, yield a total DIB-R score of 0-10. Individuals scoring eight and above on the DIB-R are classified as borderline, whereas those with a score of seven and below are considered non-borderline. The DIB-R has demonstrated reliability and validity across numerous studies, including in both clinical (Zanarini et al., 1989; Zanarini, Frakenburg, & Vujanovic, 2002) and incarcerated samples (Lorenz, Hochhausen, & Newman, 2002).

Data Analytic Plan

Regression analyses were conducted using continuous psychopathy factor scores and total DIB-R scores as independent and dependent variables, respectively. These regression analyses for Study 2 involved the same analytic procedure as Study 1. However, given that Study 2 only included female participants, gender was not included in the regression model. Accordingly, the two psychopathy factors were entered as continuous predictors of BPD into the first step of analyses, followed by their two-way interaction in the second step.[5] Any significant interactions were decomposed with the use of simple slope tests as described in Study 1 (Aiken & West, 1991). As indicated in Study 1, a sample size of approximately 224 is necessary to detect a small to medium effect size at 80% power for an alpha of .05 for an interaction term in multiple regression analyses. Given that $N = 488$ in the present study, this indicates sufficient power to detect an interaction term.

Results

Regression analyses regarding the interactive effects of F1 and F2 psychopathy on BPD symptoms are presented in Table 3. Results indicated a significant main effect of F2 ($\beta = .24$, $p <$

[5] Additional regression analyses were conducted in Studies 1 and 2 to determine if including demographic factors (e.g., age, ethnicity) as covariates would appreciably affect results. The inclusion of demographic covariates did not substantially alter the pattern of results.

.001) and no effect of F1 (β = .00, p = .94) on BPD symptoms. However, these results were qualified by a F1 × F2 interaction (β = .09, p = .05, f^2 = .01). Similar to the results of Study 1, decomposition of the interaction revealed that F2 was predictive of BPD symptoms among women high (β = .33, p = .001), but not low (β = .07, p = .47), in F1 traits. This interaction is depicted in Figure 2.

Goal #1 Discussion (Study 2)

The results of Study 2 extend the validity and generalizability of findings for females in Study 1 by replicating the results in a forensic sample of women. As predicted, results indicated that F2 traits were positively related to BPD in women, whereas F1 traits were non-significantly related to BPD. Of even greater interest was the finding that the two psychopathy factors interact with one another to predict borderline traits among women. Namely, the relationship between F2 and BPD was present only among those women who are also high in F1 traits. This suggests that, similar to the findings of Study 1, the specific pattern associated with being high in *both* F1 and F2 traits is associated with BPD among women. Thus, secondary psychopathy may reflect a female phenotypic-expression of BPD.

Given the centrality of emotional dysregulation to the BPD construct, it is likely that the relationship between psychopathic traits and BPD extends to the broader construct of emotional dysregulation as well. Namely, if BPD phenotypically manifests in terms of secondary psychopathy among women, it is likely that emotional dysregulation also manifests in this same manner. If so, then emotional dysregulation may represent a broader vulnerability factor for both psychopathy and BPD. However, in order to examine the generalizability of the BPD-secondary psychopathy relationship to the broader construct of emotional dysregulation, it is necessary to first establish the latent structure of emotional dysregulation, as per Goal #2 discussed below.

CHAPTER 3

GOAL #2: EVALUATING A CONSTRUCT OF EMOTIONAL DYSREGULATION

Study 3 addresses Goal #2 by (1) evaluating the best fitting model of emotional dysregulation and determining whether it is differentially represented in men versus women, as well as (2) clarifying how emotional dysregulation relates to existing dimensions of psychopathology (e.g., INT and EXT).

Study 3

Method

Participants

The sample included 155 women and 309 men with involvement in the criminal justice system, ranging in age from 18 to 55 (M = 30.4, SD = 8.8). Participants included those who were incarcerated in local county jails (n = 172, 37%), as well as those in the community with a history of legal convictions (n = 292, 63%). The latter participants were recruited via state, federal, and county probation/parole agencies, as well as newspaper advertisements and fliers targeted at individuals with a history of legal convictions. Individuals with a lifetime diagnosis of a psychotic (non-substance-induced) or developmental disorder were ineligible to participate in this larger assessment study, as the acute effects of these disorders can artificially inflate scores on measures of antisociality and psychopathy (e.g., antisocial behavior during mania). Those who participated but were found to have one of these exclusion criteria were omitted from the total sample (less than 3% of participants).

Procedure

Participants were administered the Structured Clinical Interview for DSM-IV-TR Axis I (SCID-I; First, Spitzer, Gibbon, & Williams, 2002) to assess for selected diagnoses involving

INT or EXT disorders, as described in more detail below. Participants were also assessed for a childhood history of conduct disorder (CD) and APD, per the current diagnostic criteria in DSM-IV-TR, using data obtained from a semi-structured life history interview. All interviews were conducted by trained doctoral students or Ph.D.-level raters. In addition to the clinical interview, participants were administered several questionnaires to index other relevant traits and behaviors.

Emotional Dysregulation Measures

The present study conceptualizes emotional dysregulation as a failure to modulate one's affective state such that emotions spiral out of control, interfere with rational thinking, and lead to breakdowns in inhibitory control (Linehan & Heard, 1992; Shedler & Westen, 2004). Given evidence for gender differences in the expression of emotional dysregulation, the latent variable of dysregulation created in the present study was fitted with several measures presumed to index the experience and manifestation of this construct across men and women, as described below.

Mood lability. In order to tap into the emotional experience represented by the construct of emotional dysregulation (as opposed to its behavioral manifestations), a composite measure of mood lability was included as an indicator variable. This variable is intended to measure the tendency to experience and have difficulty controlling intense and frequent fluctuations in mood states, which are hallmark problems that characterize emotional dysregulation. This measure includes items from the affective instability scale of the PAI-BOR (Morey, 1991), which assesses intensity and variability of mood (e.g., "My mood can shift quite suddenly"), as well as items from the Anger subscale of the Aggression Questionnaire (AQ; Buss & Warren, 2000). The latter subscale measures anger-related arousal (e.g., "At times I feel like a bomb ready to explode") and a lack of control over one's temper (e.g., "I flare up quickly, but get over it

quickly"). These two measures were selected as indicators of mood lability given that their item content reflects a tendency toward emotional reactivity and instability.

Hostility. Research indicates that angry hostility also is subsumed by the construct of emotional dysregulation (Tragesser & Robinson, 2009; Widiger & Simonsen, 2005), given that interpersonal conflict among individuals with mood lability is often triggered by feelings of resentment and hostility (Trull et al., 2008). Accordingly, items from the hostility subscale of the AQ were used as an index of this construct. The hostility subscale assesses feelings of resentment, suspicion, and alienation. Sample items include: "I wonder why sometimes I feel so bitter about things" and "At times I am so jealous I can't think of anything else."

Emotional aggression. Given that the proposed construct of emotional dysregulation conceptualizes uncontrollability of one's emotions as leading to breakdowns in inhibitory control, the Forms of Aggression Questionnaire (FOA; Verona et al., 2008) was included for the purpose of indexing aggressive acts that are *emotionally-driven* in nature. The FOA consists of 40 items that index various forms of emotionally-instigated aggression, including physical, verbal, relational, passive-rational, and property aggression. These scales measure the tendency to harm others when upset: (1) by using direct, physical force; (2) by insulting, criticizing, or verbally assaulting; (3) by manipulating their relationships or social networks (e.g., spreading rumors, ostracizing); (4) through indirect or passive means (e.g., withdrawing communication, criticizing work performance); and (5) by vandalizing or damaging property, respectively. Importantly, the verbal, relational, and passive-rational subscales of the FOA index aggressive behaviors that women are more likely to exhibit than physical aggression and are often not captured in other commonly used aggression measures. A total score on the FOA was used as an index of emotional aggression.

Reactivity in relationships. Individuals characterized by extreme levels of emotional dysregulation often have difficulty maintaining relationships due to their marked reactivity of mood, frequent shifts in emotional states, and maladaptive attempts to cope with relational conflict. Accordingly, the negative relationships scale of the PAI-BOR was used as an index of reactivity in relationships. This scale assesses the degree to which interpersonal relationships are unstable (e.g. "Once someone is my friend, we stay friends", reverse-scored) and reactive (e.g., "My relationships have been stormy") in nature.

Suicide-related behaviors. Given that emotional dysregulation is often manifested in terms of self-directed violence, the "assaults on self" and "suicide attempts" subscales of the clinician-rated Lifetime History of Aggression Questionnaire (LHA; Coccaro, Berman, & Kavoussi, 1997) were summed together to assess suicide-related behaviors. These subscales assess how frequently an individual has engaged in self-harm and/or attempted suicide since the age of 13 (ranging from "Never" to "Too many times to count").

Data Analytic Plan

Models of Emotional Dysregulation

The computer program Amos 7.0 (Arbuckle, 2006) was used to determine the best fitting model of the proposed construct of emotional dysregulation, as well as whether and how this construct is differentially represented in men versus women. Specifically, four competing models of emotional dysregulation were evaluated using confirmatory factor analysis (CFA), and gender differences in the fit of these different models were examined. These four models include a: (1) two-factor hierarchical model in which the subjective experience (e.g., mood lability, hostility) and behaviors (e.g., emotional aggression, reactivity in relationships, suicide-related behaviors) associated with dysregulation are represented by the higher-order factor of emotional

dysregulation; (2) developmental model in which the experience of dysregulation is proposed to lead to the behaviors associated with it; (3) two-factor model comprised of two factors: the experiences and behaviors associated with emotional dysregulation; and (4) one-factor model in which all five indicators of emotional dysregulation load onto a single factor, without differentiation of experiences and behaviors. These models are presented in Figures 3 – 6.

For the developmental, two-factor, and two-factor hierarchical models, mood lability and hostility served as indicators of a latent "Subjective Experience" factor, whereas emotional aggression, reactivity in relationships, and suicide-related behaviors served as indicators of a latent "Behavioral Manifestation" factor. Given that the latent Experience factor was only comprised of two indicators, these items were divided into four parcels (i.e., Mood Lability 1, Mood Lability 2, Hostility 1, Hostility 2) using the item-to-construct balance approach (Little, Cunningham, Shahar, & Widaman, 2002). The respective error variances of the mood lability and hostility parcels were allowed to covary to account for method covariance.[6]

Gender Invariance

A multigroup CFA was conducted to examine whether the four competing models demonstrated invariance across genders. Specifically, analyses compared an unconstrained baseline model to a series of constrained models that provide increasingly more restrictive tests of invariance (Vandenberg & Lance, 2000): (1) a model in which the measurement weights are constrained to be equal across genders (Constrained Model 1: *Metric Invariance);* (2) a model in which the measurement weights and intercepts are constrained across genders (Constrained Model 2: *Scalar Invariance*); and (3) a model in which the measurement weights, intercepts, and residuals are constrained across genders (Constrained Model 3: *Invariance of Error Variances*).

[6] Additional analyses were conducted in which the error variances of the Mood Lability parcels and Reactivity in Relationships were allowed to covary, as these indicators contain items from the same instrument (i.e., the PAI-BOR). Allowing the error variances to covary did not alter the pattern of results and are thus not reported here for the sake of conciseness.

To examine aspects of structural invariance (i.e., invariance of the relationship between the latent "Experience" and "Behavioral Manifestation" factors), two additional models were tested that, when applicable, imposed constraints on: (4) structural weights between the latent factors (Constrained Model 4: *Invariance of Structural Weights*); and (5) structural variances-covariances (Constrained Model 5: *Invariance of Structural Variances-Covariances*).

The fit of these various models was evaluated using several common fit indices: the chi square goodness-of-fit statistic (χ^2), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the Akaike Information Criterion (AIC). Typically, models with CFI values $\geq$ .95 and .90 and RMSEA values $\leq$ .05 and .09 are considered good and adequate fits to the data, respectively (Hu & Bentler, 1999), whereas models with smaller AIC values are preferred. The four competing models were nested, with the developmental model nested within the two-factor hierarchical model, the two-factor model within the developmental model, and the one-factor model within the two-factor model. Thus, the chi-square difference test ($\Delta\chi^2$) was used to compare relative model fit. Prior to data analysis, all variables were tested for non-normality (i.e., skewness and kurtosis), given that non-normality is often observed in psychopathology data. Any variables demonstrating significant skewness or kurtosis were appropriately transformed. Further, full information maximum likelihood estimation (FIML; Anderson, 1957) was used to account for missing data.

Results

Descriptive Statistics

Table 4 presents the means, standard deviations, and range of scores among the variables separately for men and women, as well as tests of gender differences in means. On the indicators of emotional dysregulation, men and women generally did not differ from one another, with the

exception of Reactivity in Relationships, on which women tended to score higher ($p < .001$). However, more pronounced gender differences emerged with regard to measures of externalizing and internalizing disorders, as well as psychopathy – with a pattern of results paralleling what would be expected based on the literature (see Kramer et al., 2008). Specifically, men generally exhibited greater symptoms of externalizing disorders (with the exception of alcohol dependence) and psychopathy factors (all *p*s < .05), whereas women exhibited greater symptoms of internalizing disorders (all *p*s < .05).

Test of Gender Invariance

In order to determine the best fitting model of emotional dysregulation, as well as determine whether the models demonstrated invariance across genders, a multigroup CFA was conducted with each of the four competing models described above: (1) the two-factor hierarchical model; (2) the developmental model; (3) the two-factor model; and (4) the one-factor model. Model fit indices for all four models, including the unconstrained and constrained models for each, are presented in Table 5.

Two-factor hierarchical model (Figure 3). An unconstrained baseline model was tested first, in which all parameters were allowed to vary freely across men and women. The unconstrained model provided an excellent fit to the data (see Table 5). When constraining the measurement weights to be equal across genders (Constrained Model 1), the model still demonstrated excellent fit and did not significantly reduce model fit when compared to the unconstrained model, $\Delta\chi^2 = 3.07$ ($df = 5$, $p = .69$). Next, both the measurement weights and intercepts were constrained across genders (Constrained Model 2). This model also fit the data very well. Although the chi-square difference test indicated that Constrained Model 2 showed poorer fit in comparison to Constrained Model 1, $\Delta\chi^2 = 43.28$ ($df = 7$, $p < .001$), the overall fit of

Constrained Model 2 was still excellent. As such, this model was retained as adequate for subsequent analyses, although the results may be partially biased due to measurement inequivalence. In the third model, the measurement weights, intercepts, and residuals were constrained across genders (Constrained Model 3). When imposing this set of constraints, the model provided an excellent fit to the data, and also did not show a decrement in fit compared to Constrained Model 2, $\Delta\chi^2 = 9.94$ ($df = 7$, $p = .19$). Given evidence for at least partial measurement invariance, the measurement weights, intercepts, residuals, and structural weights were constrained across genders (Constrained Model 4). This constrained model provided very good fit to the data and did not show a decrement in fit when compared to Constrained Model 3, $\Delta\chi^2 = 1.83$ ($df = 2$, $p = .40$). These results provide evidence for at least partial measurement invariance across genders, as model fit was only reduced when constraining the measurement intercepts (i.e., scalar non-equivalence). Thus, men and women only appear to exhibit mean-level differences in the constructs of interest.

Developmental model (Figure 4). The fit of the unconstrained model was excellent. When equating the measurement weights across genders (Constrained Model 1), the model also provided a superior fit to the data. Constrained Model 1 also did not result in a decrement of fit in comparison to the unconstrained model, $\Delta\chi^2 = 2.74$ ($df = 5$, $p = .74$). Next, for the test of scalar invariance, the measurement weights and intercepts were constrained (Constrained Model 2). Although this model also provided very good fit, it significantly reduced fit compared with Constrained Model 1, $\Delta\chi^2 = 43.29$ ($df = 7$, $p < .001$). Nonetheless, given the very good fit of the model, it was retained for subsequent analyses. The third model tested invariant uniqueness by constraining the measurement weights, intercepts, and residuals across genders (Constrained Model 3). This model also provided excellent fit, and importantly, it also did not significantly

reduce fit when compared to Constrained Model 2, $\Delta\chi^2 = 8.29$ ($df = 7$, $p = .31$). Given evidence for at least partial measurement invariance, the measurement weights, intercepts, residuals, and structural weights were constrained across genders (Constrained Model 4). Similar to previous models, Constrained Model 4 fit the data very well and did not demonstrate poorer fit in comparison to Constrained Model 3, $\Delta\chi^2 = 1.15$ ($df = 1$, $p = .28$). Last, for the strictest test of gender invariance, the measurement weights, intercepts, residuals, as well as the structural weights and variances-covariances were constrained (Constrained Model 5). This model provided very good fit and did not result in a decrement of fit, $\Delta\chi^2 = .63$ ($df = 1$, $p = .43$). Consistent with the above analyses, there was only evidence for scalar non-equivalence across men and women, with invariance across all remaining parameters.

Two-factor model (Figure 5). The unconstrained model provided an excellent fit to the data. Next, a model was estimated in which measurement weights were constrained to be equal across genders (Constrained Model 1), and this constrained model also fit the data very well. When Constrained Model 1 was compared to the Unconstrained Model, the constrained model did not significantly reduce model fit, $\Delta\chi^2 = 2.68$ ($df = 5$, $p = .75$). Next, the measurement weights and intercepts were constrained across genders (Constrained Model 2). Although Constrained Model 2 demonstrated excellent fit, it did result in a decrement of fit compared to Constrained Model 1, $\Delta\chi^2 = 43.43$ ($df = 7$, $p < .001$), similar to the above analyses. Nonetheless, given the excellent fit of the model, it was retained for subsequent analyses, although the results may be partially biased due to measurement inequivalence. As such, the measurement weights, intercepts, and residuals were subsequently constrained across genders (Constrained Model 3). This model also provided very good fit and did not significantly reduce fit in comparison to Constrained Model 2, $\Delta\chi^2 = 7.52$ ($df = 7$, $p = .38$). In the final test of invariance, the

measurement weights, intercepts, and residuals – as well as the factor variances-covariances – were equated across genders (Constrained Model 5). The fit of Constrained Model 5 was very good, and it also did not reduce model fit in comparison to Constrained Model 3, $\Delta\chi^2 = 2.93$ ($df = 4$, $p = .40$). Thus, similar to the findings of the Developmental Model, there is evidence for equivalence across genders, with the exclusion of the measurement intercepts.

One-factor model (Figure 6). The Unconstrained Model provided an excellent fit to the data. Next, a model was estimated in which measurement weights were constrained to be equal across genders (Constrained Model 1); this constrained model also provided an excellent fit to the data. When Constrained Model 1 was compared to the Unconstrained Model, the constrained model did not significantly reduce model fit, $\Delta\chi^2 = 3.33$ ($df = 6$, $p = .77$). Next, both the measurement weights and intercepts were constrained across genders (Constrained Model 2), and this model also fit the data very well. Although the chi-square difference test indicated that Constrained Model 2 showed poorer fit in comparison to Constrained Model 1, $\Delta\chi^2 = 43.30$ ($df = 7$, $p < .001$), the overall fit of Constrained Model 2 was still very good. As such, this model was retained as adequate for subsequent analyses. Lastly, for the strictest test of measurement invariance, all parameters (i.e., measurement weights, intercepts, and residuals) were constrained across genders (Constrained Model 3). Similar to previously constrained models, Constrained Model 3 provided an excellent fit to the data. Constrained Model 3 also did not show a decrement in fit when compared to Constrained Model 2, $\Delta\chi^2 = 8.83$ ($df = 7$, $p = .27$). Thus, similar to previous models, there is evidence for gender invariance across all parameters, with the exclusion of the intercepts (i.e., indicating mean-level differences between men and women).

Model Comparisons

As indicated in Table 5, the four competing models of emotional dysregulation appear to provide comparable fit (i.e., all CFI values > .95, RMSEA values ≤ .05). In order to provide a formal statistical test of relative model fit, chi-square difference tests were conducted between nested models (i.e., two-factor hierarchical vs. developmental, two-factor vs. developmental, one-factor vs. two factor). Given evidence for at least partial measurement invariance across all four models, the most constrained models from the above analyses were used in model comparisons (i.e., Constrained Model 4 for the two-factor hierarchical model; Constrained Model 5 for the developmental and two-factor models; Constrained Model 3 for the one-factor model). In comparing the two-factor hierarchical and developmental models, the chi-square difference test did not indicate a significant difference in model fit, $\Delta\chi^2 = 2.56$ ($df = 2$, $p = .27$). Similarly, the developmental and two-factor models also did not differ in relative fit, $\Delta\chi^2 = .18$ ($df = 1$, $p = .67$). Lastly, the two-factor and one-factor models also did not differ in fit, $\Delta\chi^2 = .45$ ($df = 1$, $p = .50$). Per Kline (2005), when there is no significant difference between nested models, the more parsimonious model fits the data equally well compared to the more complex model and is preferred. Accordingly, the one-factor model was retained as the best-fitting model in subsequent analyses.

Measurement Invariance of Specific Indicators in the One-Factor Model

The above results indicate that the best fitting model of emotional dysregulation (i.e., the one-factor model) demonstrates at least partial measurement invariance across genders, as evidenced by both metric invariance and invariance of error variances (Vandenberg & Lance, 2000). Although these findings suggest that the one-factor model of emotional dysregulation is comparable across men and women, results indicated that there were nonetheless differences in

the measurement intercepts across genders, resulting in a lack of scalar invariance. Such results are not surprising, given that men and women often exhibit mean-level differences in what are typically considered "gender-stereotyped" behaviors, such as self-directed violence and chaotic interpersonal relationships. Thus, post-hoc analyses investigated the measurement intercepts of each individual indicator to determine which indicator(s) were accounting for the observed scalar non-equivalence across genders.[7]

An unconstrained baseline model was tested first, in which the measurement weights and residuals were constrained to be equal across genders (per the above findings for measurement invariance), but the measurement intercepts were allowed to vary freely. The unconstrained model demonstrated excellent fit, $\chi^2 = 42.72$ ($df = 37$, $p = .24$), CFI = .995, RMSEA = .02, AIC = 108.72. Next, the intercepts for the two hostility parcels were constrained to be equal across genders while the other intercepts were allowed to vary. When constraining hostility, the model still provided an excellent fit to the data, $\chi^2 = 45.33$ ($df = 39$, $p = .23$), CFI = .995, RMSEA = .02, AIC = 107.33, and – as expected – did not result in poor model fit, $\Delta\chi^2 = 2.61$ ($df = 2$, p = .27). Similarly, when the intercepts for the mood lability parcels were constrained, the model also provided excellent fit, $\chi^2 = 43.26$ ($df = 39$, $p = .29$), CFI = .997, RMSEA = .02, AIC = 105.26, and did not show a decrement in fit compared to the unconstrained model, $\Delta\chi^2 = .54$ ($df = 2$, $p = .76$). These analyses suggest that mean levels of hostility or mood lability do not differ across genders.

When constraining the intercept for emotional aggression, the model demonstrated excellent model fit, $\chi^2 = 43.29$ ($df = 32$, $p = .26$), CFI = .996, RMSEA = .02, AIC = 107.29. Moreover, this model did not significantly reduce model fit when compared to the unconstrained

[7] Despite evidence for metric invariance across the measurement weights as a whole, additional analyses were conducted to ensure that specific measurement weights did not vary across men and women. Analyses indicated no differences in the weights for mood lability, hostility, reactivity in relationships, suicide-related behaviors, or emotional aggression.

model, $\Delta\chi^2 = .57$ ($df = 1$, $p = .45$), consistent with the hypothesis that men and women exhibit similar levels of emotional aggression. Following this, the intercept for suicide-related behaviors was constrained while the other intercepts were allowed to vary freely. This model still fit the data very well, $\chi^2 = 49.39$ ($df = 38$, $p = .26$), CFI = .991, RMSEA = .03, AIC = 113.39. However, as expected, constraining the intercept for suicide-related behaviors resulted in a significant decrement in model fit, $\Delta\chi^2 = 6.67$ ($df = 1$, $p = .01$), suggesting mean-level differences in men versus women. Last, the intercept for reactivity in relationships was constrained whereas the other intercepts were allowed to vary freely. Although this constrained model fit the data very well, $\chi^2 = 63.92$ ($df = 38$, $p = .005$), CFI = .98, RMSEA = .04, AIC = 127.92, it also resulted in a decrement of fit when compared to the unconstrained model, $\Delta\chi^2 = 21.19$ ($df = 1$, $p < .001$), which is consistent with the hypothesis that women characterized by emotional dysregulation experience greater disruptions in their relationships. Together, these analyses suggest that the decrement in fit that occurs when constraining indicator means across men and women (i.e., Constrained Model 2) arises because of suicide related behaviors and reactivity in relationships.

Relationship to Existing Dimensions of Psychopathology

In order to assess the discriminant and convergent validity of the emotional dysregulation construct, additional correlational analyses were conducted to examine the association between the best fitting model of emotional dysregulation (i.e., one-factor) and syndromes classified under the INT or EXT spectrum. These analyses used latent factor scores of emotional dysregulation and correlated them with the INT and EXT dimensions in order to determine the specificity of their association with emotional dysregulation in men versus women.

The current investigation used four symptom count variables as indices of EXT, as traditionally defined by Krueger and colleagues (Krueger et al., 2002, 2005): childhood conduct

disorder (CD), antisocial personality disorder (APD), alcohol dependence (AD), and drug dependence (DD).[8] The following symptom count variables were used as indices of INT: major depressive disorder (MDD) and generalized anxiety disorder (GAD) – as measured via the SCID-I (First et al., 2002) – as well as the anhedonic depression and anxious arousal subscale scores from the Mood and Anxiety Symptom Questionnaire (MASQ; Watson, Weber, Assenheimer, & Clark, 1995. Given evidence for distinct two INT subfactors ("fear" and "anxious-misery" subfactors; Krueger, 1999), the anxious arousal subscale of the MASQ was used as an index of the fear subfactor, whereas MDD, GAD, and the anhedonic depression subscale of the MASQ were used as indicators of the anxious-misery subfactor.

Prior to conducting correlational analyses, a CFA was first conducted in order to ensure that the dimensional-hierarchical INT-EXT model of psychopathology fit the data well in the present sample (see Figure 7). The fit of the model was evaluated using the same fit indices and criteria described above (i.e., χ^2, CFI, RMSEA). Results indicated that the model demonstrated an adequate fit, $\chi^2 = 80.93$ ($df = 32$, $p < .001$), CFI = .92, RMSEA = .06 and loadings did not differ significantly across genders, $\Delta\chi^2 = 11.23$ ($df = 6$, $p = .08$). Following this validation of the dimensional-hierarchical model, zero-order correlational analyses were conducted between the emotional dysregulation factor score and the latent factor scores of the INT and EXT dimensions. A summary of these analyses can be found in Table 6.

As can be seen in Table 6, emotional dysregulation demonstrated significant correlations with both the INT and EXT dimensions. Based on the literature (e.g., Chaplin et al., 2008;

[8] Symptom count variables of DSM diagnoses were used in analyses instead of dichotomous diagnoses (i.e., yes/no) for several reasons. First, some research suggests that psychopathology is best organized on a dimensional spectrum (e.g., Krueger, 1999; Krueger et al., 2005). Thus, attempting to dichotomize dimensional phenomena results in the loss of valuable information (MacCallum et al., 2002). Second, individuals who fall one symptom count below diagnostic threshold will not receive a diagnosis, despite the fact that they present with more symptoms than not. Thus, the number of symptoms endorsed is a better indicator of impairment in functioning than is the presence or absence of a diagnosis (Robins & Price, 1991). Third, symptom count variables provide higher statistical power in community samples where there are lower base rates of psychopathology than clinical samples (Krueger et al., 2002). Thus, lifetime symptom counts of threshold symptoms were used in the current analyses.

Kramer et al., 2008), it was expected that emotional dysregulation in men would be most related to the EXT dimension, whereas in women it would be related to both INT and EXT. Interestingly, however, the relationship between emotional dysregulation and the INT and EXT dimension did not differ across genders (z = .60 and -.14 for INT and EXT, respectively; ps > .05). Nonetheless, results of Steiger's z-test for dependent correlations indicated that there were differences *within* gender. Specifically, while emotional dysregulation was significantly related to both INT and EXT in women, the relationship between emotional dysregulation and INT was significantly stronger than the relationship between emotional dysregulation and EXT (z = 2.24, p = .03). Unexpectedly, this same pattern of results also emerged for men (i.e., emotional dysregulation was more related to INT than to EXT) (z = 2.66, p = .007).

Follow-up analyses were subsequently conducted to examine correlations between specific indicators of INT and EXT and their relationship with emotional dysregulation across genders. These secondary analyses revealed that depression – as indexed by MDD symptom counts, as well as the MASQ Anhedonic Depression Scale – demonstrated stronger relationships with emotional dysregulation than did other indicators of either INT or EXT. For example, across both men and women, emotional dysregulation correlated more strongly with MASQ Anhedonic Depression than it did with either drug dependence (z = 3.43 and 2.99 for women and men, respectively, ps < .01) or alcohol dependence (z = 2.33 and 2.43 for women and men, respectively, ps < .05). This same pattern of results emerged for MDD in women, as emotional dysregulation demonstrated stronger relationships with MDD than it did with drug dependence (z = 2.50, p = .01) or alcohol dependence (z = 1.24, p = .21), albeit insignificantly for the latter. Accordingly, the stronger relationship that was found between emotional dysregulation and INT (versus EXT) across both men and women is likely accounted for by the consistently stronger

relationships between emotional dysregulation and depression – specifically, the MASQ Anhedonic Depression scale (across both men and women) and MDD (among women only).

Goal #2 Discussion

As a whole, the results of Study 3 demonstrate that the two-factor hierarchical, developmental, two-factor, and one-factor models each provide an excellent representation of the construct of emotional dysregulation. Nonetheless, when these four competing models were compared via the chi-square difference test, the one-factor model was found to provide a similar fit relative to the more complex models; thus, the more parsimonious one-factor model was preferred. This finding indicates that the subjective experience of and behaviors associated with emotional dysregulation are intertwined in such a manner that they may be essentially indistinguishable.

Moreover, the above results indicate that the preferred model of emotional dysregulation (i.e., the one-factor model) is at least partially invariant with respect to gender (Vandenberg & Lance, 2000). Namely, analyses conducted on the four competing models provided uniform evidence for measurement invariance across men and women, with the exception of certain measurement intercepts. Specifically, the measurement intercepts for both "suicide-related behaviors" and "reactivity in relationships" varied across men and women – with women exhibiting higher levels of both. These findings are to be expected, given that mean-level differences are commonly found between men and women with regard to these two behaviors (e.g., Miller & Meloy, 2006; Ross & Heath, 2002). Accordingly, the construct of emotional dysregulation, at least as it is defined here, should be considered equivalent across genders.

CHAPTER 4

GOAL #3: ASSOCIATIONS BETWEEN GENDER, PSYCHOPATHY FACTORS, AND EMOTIONAL DYSREGULATION

Study 3 also addressed Goal #3 by moving beyond the diagnosis of BPD and considering how the broader construct of emotional dysregulation relates to gender and psychopathic traits. Namely, if secondary psychopathy does reflect a female phenotypic-expression of BPD, this study will also determine whether secondary psychopathy reflects a manifestation of emotional dysregulation among women as well.

Method

Participants

This sample consists of the same individuals described above in the methods for Goal #2.

Psychopathy Measure

Data collected from a semi-structured interview and review of public criminal records were used to rate participants on 12 psychopathic traits via the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995). Criminal history information provided by the participant was verified from the criminal records review. The PCL:SV is a shortened version of the PCL-R (Hare, 1991) and contains 12 items designed to index psychopathic traits in non-incarcerated and incarcerated samples. Research indicates that the PCL:SV maintains the same psychometric properties as the PCL-R (Cooke, Michie, Hart, & Hare, 1999). Each trait on the PCL:SV is rated on a three-point scale ranging from 0 (*Not at all characteristic*) to 2 (*Extremely characteristic*). Research indicates that the items can reliably be summed to reflect the F1 and F2 dimensions of psychopathy (Hare et al., 1990; Harpur, Hakstian, & Hare, 1988; Harpur, Hare, &

Hakstian, 1989). Given this, separate PCL:SV psychopathy factor scores were calculated to reflect these two dimensions.

Childhood Abuse Measure

The short form of the Childhood Trauma Questionnaire (CTQ-SF; Bernstein & Fink, 1998) is a 28-item self-report questionnaire that is widely used to retrospectively assess traumatic experiences during childhood. The questionnaire includes 25 items that measure emotional, physical, and sexual abuse, as well as emotional and physical neglect. The CTQ-SF also includes a 3-item minimization/denial subscale intended to detect the potential underreporting of maltreatment. Items are presented in a 5-point Likert-type format, with responses ranging from "never true" to "always true." For the purposes of the present study, the emotional, physical, and sexual abuse subscales were combined to form a composite abuse score. The CTQ, as well as the short form, have been shown to demonstrate good reliability and validity (Berstein et al., 1994; Berstein et al., 2003).

Data Analytic Plan

After establishing the theorized construct of emotional dysregulation per Goal #2, structural equation modeling was used to extend the results of Study 1 and Study 2 beyond the construct of BPD. Namely, the computer program Amos 7.0 (Arbuckle, 2006) was used to test a model that estimated the direct effects of the two psychopathy factors (F1 and F2) and their interaction (F1 × F2) on emotional dysregulation (see Figure 8). The structural equation model included three observed variables (the two psychopathy factors and their interaction) and one latent variable (emotional dysregulation). The latent emotional dysregulation variable was represented by the one-factor model, given that this was validated as the preferred model of emotional dysregulation per Goal #2.

In order to test the hypothesis that gender moderates the relationship between psychopathy factors and emotional dysregulation, multigroup analyses were conducted to determine if there were gender differences in the hypothesized paths from psychopathy to emotional dysregulation. Specifically, analyses compared the fit of an unconstrained model to three increasingly restrictive gender-invariant models: (1) a model in which the path from F1 to emotional dysregulation was constrained across genders (Constrained Model 1); (2) a model in which in which the paths from both F1 and F2 to emotional dysregulation were constrained across genders (Constrained Model 2); and (3) a model in which the paths between F1, F2, and their interaction (F1 × F2) was constrained across genders (Constrained Model 3). Supplementary analyses were also conducted to examine if the relationship between psychopathy and emotional dysregulation was accounted for by a history of childhood abuse. The fit of these path models was evaluated using the same fit indices and criteria described above in Goal #2 (i.e., χ^2, CFI, RMSEA).

Results

The model tested first involved one in which all parameters of the measurement model (i.e., one-factor) were constrained across genders (as per the results of Goal #2), but parameters in the structural model (i.e., F1, F2, F1 × F2) were allowed to vary freely across men and women (referred to here as the unconstrained structural model). This model provided a good fit to the data, $\chi^2 = 171.22$ ($df = 81$, $p < .001$), CFI = .94, RMSEA = .05. As expected, the path between F1 and emotional dysregulation demonstrated a negative relationship among men ($\beta = -.24$, $p < .001$). Interestingly, however, there was no association between F1 and emotional dysregulation among women ($\beta = -.07$, $p = .46$). The path from F2 to emotional dysregulation was in the expected direction across genders, with positive relationships for both men ($\beta = .51$, $p < .001$)

and women (β = .60, $p < .001$). Of particular interest, however, were the results regarding the effect of the interaction between the two psychopathy factors (F1 × F2) on emotional dysregulation. Consistent with hypotheses, F1 × F2 predicted emotional dysregulation in women (β = .21, $p = .02$) but not men (β = -.05, $p = .36$).

In order to decompose the F1 × F2 interaction, simple slope tests were conducted within each gender to analyze the effect of F2 at varying levels of F1 (i.e., ±1 *SD* from the mean). As expected, analyses revealed similar findings to those observed in Studies 1 and 2. Namely, F2 was predictive of emotional dysregulation among women who were also high (β = .61, $p = .001$), but not low (β = .26, $p = .20$), in F1 traits. In other words, the effect of F2 on emotional dysregulation was intensified at higher levels of F1. Among men, the relationship between F2 and emotional dysregulation was similar regardless of F1 scores (βs = .55 and .45 for men low and high in F1, respectively, ps < .001). Importantly, these findings are consistent with the results of Goal #1, which suggest that the interaction of the two psychopathic traits is associated not only with BPD, but also with emotional dysregulation more broadly, and specifically among women. The standardized parameter estimates for women and men separately can be found in Figure 8.

To directly establish gender moderation in the paths between psychopathy and emotional dysregulation, multigroup analyses (comparing the fit of unconstrained and gender-invariant structural models) were subsequently conducted. In the first set of analyses, the unconstrained structural model was compared to a model in which the path from F1 to emotional dysregulation was held constant across genders (Constrained Model 1). This constrained model fit the data well, $\chi^2 = 172.56$ ($df = 82$, $p < .001$), CFI = .94, RMSEA = .05, and did not show a decrement in fit relative to the unconstrained structural model, $\Delta\chi^2 = 1.35$ ($df = 1$, $p = .25$). This suggests that

the relationship between F1 and emotional dysregulation is equivalent across men and women. Next, both the paths from F1 and F2 were constrained across genders (Constrained Model 2). Similarly, this model provided a good fit to the data, $\chi^2 = 173.84$ ($df = 83$, $p < .001$), CFI = .94, RMSEA = .05. It also did not demonstrate poorer fit in comparison to Constrained Model 1, $\Delta\chi^2 = 1.28$ ($df = 1$, $p = .26$), indicating that the path from F2 to emotional dysregulation is also equivalent across genders. Last, all the paths (F1, F2, and F1 × F2) from psychopathy to emotional dysregulation were constrained. Although Constrained Model 3 provided a good overall fit, $\chi^2 = 178.02$ ($df = 80$, $p < .001$), CFI = .94, RMSEA = .05, it did result in a decrement in fit relative to Constrained Model 2, $\Delta\chi^2 = 4.18$ ($df = 1$, $p = .04$). Thus, constraining the interaction between the two psychopathy factors suggests gender differences in the relationship between the combination of F1 and F2 (i.e., psychopathy) and emotional dysregulation, confirming significant differences in the estimates found above for the path between F1 × F2 and emotional dysregulation in men versus women.

Does Child Abuse Explain the Relationship between Psychopathy and Emotional Dysregulation?

Childhood abuse is a risk factor that is hypothesized to contribute to the development of both BPD (Linehan, 1993; Gunderson, 2001 and psychopathy (Karpman, 1941; Mealy 1995; Porter, 1996). Given this shared risk factor, it is possible that the proposed relationship between psychopathy, emotional dysregulation, and gender is accounted for by a history of childhood abuse. Thus, supplementary analyses were conducted on the model described per Goal #3, with a path from abuse to emotional dysregulation included in the model. In particular, analyses tested whether including abuse in the model altered the path estimates from the psychopathy factors to emotional dysregulation in men and women. Given the small correlations between child abuse

and the two psychopathy factors (*r*s = .05 and .13 for F1 and F2, respectively, *p*s = .28 and .01), the correlational paths from psychopathy to abuse were not included in the model.

The overall fit of the model with child abuse was adequate, $\chi^2 = 229.02$ (*df* = 99, *p* < .001), CFI = .92, RMSEA = .05. As expected, abuse significantly predicted emotion dysregulation in both men (β = .29, *p* < .001) and women (β = .44, *p* < .001). Even after introducing the covariate, though, the remaining paths in the model continued to demonstrate similar relationships with emotional dysregulation as they did in the original analyses. Namely, in men, the paths from F1 and F2 still predicted emotional dysregulation in expected negative and positive directions, respectively (βs = -.27 and .51 for F1 and F2, respectively, *ps* < .001). Similarly, the path from F1 × F2 to emotional dysregulation remained non-significant in men (β = -.008, *p* = .88). In women, F1 remained non-significant in predicting emotional dysregulation (β = .00, *p* = .99), while the path from F2 to emotional dysregulation remained positive (β = .49, p < .001). Lastly, the path from F1 ´ F2 to emotional dysregulation still demonstrated a positive and significant relationship in women, in a similar magnitude compared to the model without the covariate (β = .18, *p* = .04). This suggests that, although abuse independently contributes to the prediction of emotional dysregulation, it does not account for the relationship between psychopathy factors and emotional dysregulation in either gender.

CHAPTER 5

GENERAL DISCUSSION

The current paper is the first to provide evidence regarding gender specificity in the relationship between the psychopathy factors, BPD, and emotional dysregulation. First, across two independent samples, results demonstrated that the interaction of F1 and F2 traits was associated with BPD, specifically among women (**Goal #1**). Moreover, the current findings suggest that psychopathy (presumably the secondary variant) and BPD overlap substantially in women and, accordingly, may represent gender-differentiated manifestations of the same dispositional vulnerability. While the two disorders are admittedly not identical (given their different symptom clusters, such as greater other-directed violence in psychopathy and self-directed violence in BPD), the present findings nonetheless support the notion that the vulnerabilities associated with interactive processes of F1 and F2 traits are predictive of BPD among women. The consistency of this finding across two samples characterized by relatively low and high base rates of psychopathy, respectively, suggests that this association is valid for women exhibiting symptoms at different extremes of the spectrum.

Furthermore, the current results indicate that this gender-specific association between the psychopathy factors and BPD appears to generalize to the vulnerability factor presumed to promote BPD symptoms: emotional dysregulation. First, confirmatory factor analyses revealed that emotional dysregulation is best represented by a one-factor model, which comprises constructs of mood lability, hostility, emotional aggression, suicide-related behaviors, and reactivity in relationships (**Goal #2**). This model of dysregulation appears to hold true for both men and women, as there were no gender differences that emerged in analyses, with the exception of mean-level differences in specific constructs of interest. In particular, there was

evidence for measurement equivalence across genders with regard to emotional aggression, hostility, and mood lability. However, there was non-equivalence with regard to the constructs of reactivity in relationships and suicide-related behaviors, with women exhibiting greater levels of both. Second, structural equation modeling revealed that the aforementioned relationship between the psychopathy factors and BPD in women is generalizable to the broader construct of emotional dysregulation, thus providing further support for the validity of dimensional personality trait models of psychopathology (**Goal #3**). In view of these findings, the present paper raises questions about the phenotypic heterogeneity of psychopathy across genders and has several implications for personality disorder taxonomies in future editions of the DSM.

Goal #1: Psychopathy Factor Interactions, Gender, and BPD

Consistent with Goal #1, findings from Studies 1 and 2 suggest that the interplay of F1 and F2 psychopathy traits is associated with BPD symptoms in women. First, F2 psychopathic traits were found to be independently associated with BPD symptoms in both men and women. This finding is not surprising, given overlapping symptom clusters in psychopathy and BPD, such as impulsivity (e.g., substance use, reckless spending), emotional reactivity (e.g., mood swings, irritability), and high levels of anger and aggression (e.g., temper tantrums, physical fights). However, of even greater interest was the finding that F1 traits were also predictive of BPD in women, but especially in the presence of high F2 traits. Conceptually, F1 traits associated with deficient emotionality and callousness may seem like poor correlates of BPD, a disorder in which emotionality and affective extremes are often considered hallmarks. Indeed, the simple effect of F1 was negatively or non-significantly associated with BPD across the college (Study 1) and forensic samples (Study 2), respectively. Importantly, though, these results

suggest that it is the *interaction* of F1 and F2 traits that is associated with BPD, even above the influence of F2 traits – but only for women.

One interpretation of these findings requires attention to the nature and complexity of symptoms associated with BPD, as they promote an alternation between emotional and behavioral extremes. In particular, the pattern of behavior associated with certain BPD symptoms (e.g., frantic efforts to avoid abandonment, relationships that waver between devaluation and idealization) often necessitates an oscillation between extremes of highly emotional, impulsive, and aggressive reactivity on the one hand, and disengaged, calculating, and emotionally restrictive behavior on the other hand (Linehan, 1993). The results of Goal #1 suggest that this latter extreme is represented by F1 traits, while the former is represented by F2 traits. Moreover, F2 may be a weaker correlate of BPD at lower levels of F1, as being low in F1 traits implies that one has the capacity for greater empathic responding. Therefore, even if a woman is high on F2 traits (e.g., impulsivity, anger), being low in F1 traits is likely to prevent her from acting upon these dysregulated urges (i.e., because she is able to recognize the consequences of her actions on others; Miller & Eisenberg, 1998). In contrast, a woman high in F2 traits who is *also* high in F1 traits would be low on empathy and, thus, would have no buffer preventing her from acting upon the dysregulated, impulsive, and aggressive urges promoted by her F2 traits. Thus, the effect of F2 on BPD is intensified at high levels of F1, suggesting that the overall constellation of BPD symptoms is highly related to the interplay of the two psychopathy factors.

A greater understanding of the relationship between the two psychopathy factors and how they are currently measured may help further inform how their interaction is associated with BPD. As it was originally developed, the PCL-R was intended to capture the heterogeneous and multidimensional nature of psychopathy within a single psychometric instrument (Patrick, 2006).

However, subsequent research conducted on the measure has consistently found evidence for two distinct factors, which as discussed in the present paper are commonly referred to as F1 and F2 (Harpur et al., 1988, 1989). Importantly, when the two psychopathy factors are entered as distinct predictors in analyses, results evidence a different pattern of effects than would be observed by simply collapsing them into a total PCL-R score. This is due to the fact that using a total psychopathy score captures just the shared variance between the two factors and, accordingly, indexes psychopathy in terms of its original, unitary conceptualization. In contrast, entering F1 and F2 separately allows one to account for the unique variance associated with each factor; thus, suppressor effects are often observed when the common variance between the two factors is accounted for (Hicks & Patrick, 2006). Making this distinction between the two factors has important theoretical implications, as the unique variance associated with each factor is thought to reflect two different forms of vulnerability that may (or may not) converge with one another to phenotypically manifest as psychopathy (Fowles & Dindo, 2006). Namely, the unique variance in F1 is thought to index vulnerability towards emotional detachment, whereas the unique variance in F2 is thought to index vulnerability towards severe emotional and behavioral dysregulation (e.g., Hicks & Patrick, 2006; Verona et al., 2001).

In this respect, F1 and F2 can be viewed as multidimensional constructs that can exist separately from one another, outside the context of psychopathy. When the two factors do converge with one another, however, it is then that they represent the existing construct of psychopathy. The BPD-secondary psychopathy conceptualization advanced in the current paper is grounded in this latter relationship, wherein the two factors interact in the context of secondary psychopathy to statistically predict BPD in women. Thus, one interpretation is that BPD may be a female-specific manifestation of psychopathy – at least the secondary variant – among women

who oscillate between extremes of emotional dysregulation and manipulative behavior. This potential female variant of psychopathy is similar to the one recognized in a recent cluster analysis of high psychopathy female offenders (Hicks et al., 2010).

Despite preliminary evidence for the existence of a "borderline psychopath" in women, more research is needed to fully explore the extent to which psychopathy and BPD share similar etiological pathways in women more so than men. However, evidence informing the nature of women's externalizing tendencies supports the notion that BPD and psychopathy may manifest in a similar vein among women. In particular, for women, the emotional dysregulation associated with secondary psychopathy and BPD is likely to manifest within relational, interpersonal, and intimate contexts – given that women's externalizing behaviors are most often directed towards intimates and acquaintances, whereas men are more likely to externalize in relation to strangers (Kellermann & Mercy, 1992; Miller & Meloy, 2006). Indeed, the current studies found evidence that women are more likely to endorse reactivity in relationships in the context of their emotional dysregulation. Thus, for women, both disorders are highly relational in nature and likely to revolve around destructive interpersonal dynamics. Given this, examinations of psychopathy with women in particular would benefit from assessing self- and other-directed harm that manifests in more female-typical ways (i.e., that which occurs in interpersonal contexts), whereas examinations of BPD would benefit from assessing other-directed harm more systematically.

Relatedly, the link between psychopathy and BPD evidenced in this paper can also help explain the high co-occurrence between self and other-directed violence that is often observed in externalizing women (e.g., Sadeh, Javdani, Finy, & Verona, 2011). Classically, BPD is associated with engagement in self-harm and suicidality (APA, 2000; Linehan, 1993; Stone,

1990), while psychopathy is viewed as one of the best predictors of other-directed violence (Hart, 1998; Walters & Heilbrun, 2009). Despite the fact that these literatures have often remained disparate, women with BPD are likely at risk for both types of violence – especially in the context of relationships – precisely because they tend to score high on both F1 and F2 traits. While F1 traits have been shown to be protective against self-directed violence – and for females in particular (Javdani, Sadeh, & Verona, 2010; Verona, Hicks, & Patrick, 2005) – F2 traits promote risk for suicidal behaviors (Douglas, Herbozo, Poythress, Belfrage, & Edens, 2006; Verona, Patrick, & Joiner, 2001). The present finding that the *interaction* of F1 and F2 traits is associated with BPD in women reconciles the paradox that suicidal women with BPD are often aggressive, and violent women with psychopathy are often suicidal.

Goals #2 and #3: Emotional Dysregulation as the Link between BPD and Psychopathy?

Current results indicate that the high levels of overlap, or comorbidity, between psychopathy and BPD among women may be attributable to the broader construct of emotional dysregulation. Namely, findings from Study 3 indicate that the interaction of F1 and F2 traits among women is not only associated with BPD, but emotional dysregulation more broadly as well. Importantly, the emotional dysregulation construct tested in the current study also demonstrated at least partial measurement equivalence across genders. While there was evidence for *scalar* non-equivalence across genders (i.e., mean-level differences), this non-equivalence was accounted for by only two of the measurement intercepts – "suicide-related behaviors" and "reactivity in relationships" – with women exhibiting higher levels of both. However, these findings are not surprising, given that (1) females evidence higher levels of suicide attempts and non-suicidal self-injury (although not completed suicides), and (2) dysregulation in females is often manifested within relational contexts (Bridge et al., 2006; Miller & Meloy, 2006).

Furthermore, and more importantly, there was nonetheless evidence for *metric* invariance across genders, which confirms that the indicator variables measure emotional dysregulation similarly in men versus women (i.e., they demonstrate the same functional relationship with emotional dysregulation across genders). Given this evidence, the present conceptualization of emotional dysregulation should be considered equivalent across genders.

Although the two-factor hierarchical, developmental, two-factor, and one-factor models each provided an excellent fit to the construct of emotional dysregulation, the one-factor model nonetheless provided a superior fit due to parsimony. While the experiences and behaviors associated with emotional dysregulation may be distinct constructs in theory, current results indicate that they may be too interconnected in real-world contexts to be meaningfully distinguished. This finding may be explained by the fact that individuals characterized by severe forms of dysregulation (e.g., BPD, psychopathy) lack the appropriate resources to engage in self-control behaviors when under emotional distress (Cyders & Smith, 2007, 2008; Muraven & Baumeister, 2000; Sprague & Verona, 2010). That is, they are unable to override their emotional response (i.e., their experience of dysregulation) and, in turn, almost inevitably act out upon their dysregulated urges (i.e., manifest it behaviorally). Accordingly, the subjective experience and behavioral manifestation of dysregulation are essentially coexisting constructs. This is in contrast to healthy (i.e., less dysregulated) individuals, who may occasionally have the inner *experience* of dysregulation, but nonetheless possesses the adequate self-control behaviors necessary to prevent themselves from acting upon their urges.

Furthermore, while present results indicate that childhood abuse is related to emotional dysregulation across men and women, it nonetheless does not play a role in the specific association between psychopathy and emotional dysregulation. Rather, abuse appears to be

independent of psychopathy in the prediction of emotional dysregulation. These findings indicate that while experiencing abuse as a child may lead to deficits in emotion regulation abilities, the mechanism by which abuse may contribute to emotional dysregulation is distinct from the mechanism that connects psychopathic traits to emotional dysregulation. Thus, the relationship between psychopathy and emotional dysregulation is contingent upon etiological factors other than abuse (e.g., genetic predisposition, peer relationships, low socioeconomic status).

Implications for Measurement, Assessment, and Treatment

Results from Study 3 provide preliminary evidence that emotional dysregulation represents a common vulnerability that gives rise to both BPD and psychopathy, particularly in women. The notion that latent liability factors can confer risk for distinct forms of psychopathology is supported by an abundance of research on personality trait based models of DSM disorders (Krueger & Eaton, 2010; Samuel & Widiger, 2006; Watson, 2005; Widiger & Simonsen, 2005). With regard to Axis II pathology in particular, there is evidence that the structure of personality disorders can be adequately represented via dimensional models of personality, such as the five-factor model (FFM; Goldberg, 1993). The FFM has been argued to adequately represent the structure of both normal and abnormal personality traits, with personality disorders reflecting the extreme end of these traits (Clark, 2007; Krueger & Tackett, 2003; Morey et al., 2002; Widiger & Trull, 2007). For example, BPD can be conceptualized in terms of a maladaptive variant of the FFM (Trull, Widiger, Lynam, & Costa, 2003), specifically defined by high levels of neuroticism, and low levels of agreeableness and conscientiousness (Samuel & Widiger, 2008). Similarly, research on the "vulnerable dark triad" (Miller et al., 2010) indicates that secondary psychopathy is related to these same traits (i.e., high levels of negative emotionality, antagonism, and disinhibition). Thus, while the phenotypic components of

BPD and secondary psychopathy are markedly different from one another (e.g., self- versus other-directed violence, respectively), they can still be conceptualized in terms of a similar personality structure that represents a liability for both disorders.

The fact that personality pathology can be represented by more global personality trait dimensions underscores the need to be cognizant about the ways in which psychopathy and BPD are currently measured and assessed. In particular, if emotional dysregulation does indeed represent a latent trait vulnerability for both disorders, this finding has potentially critical implications for the classification and organization of personality pathology in future versions of the DSM. In particular, a redesign of the current system may be necessary in order to appropriately assess these syndromes in men versus women. Potential suggestions and areas for further consideration are discussed below.

One issue that is raised concerns whether it would be beneficial to move towards a more trait-based approach in informing how psychopathology is organized and conceptualized. Using such an approach would facilitate an understanding of disorders on the basis of their latent trait factors (e.g., emotional dysregulation in the case of BPD and psychopathy), as opposed to behavioral indicators that can differ in their manifestation (e.g., self- versus other-directed violence in BPD and psychopathy, respectively). The DSM-5 task force has attempted to move in such a direction by proposing a "hybrid categorical-dimensional model" that uses a largely personality trait-based approach to inform how personality pathology is conceptualized (APA, 2010; Skodol et al., 2011). The proposed revisions recommend that individuals be rated on the basis of six different *categorical* personality disorder types (e.g., antisocial, avoidant, borderline, narcissistic, obsessive-compulsive, and schizotypal types) and subsequently rated on the basis of several different *dimensional* personality traits. These dimensional personality trait domains are

based on the pathological five model (PFM; Krueger & Eaton, 2010), which is a maladaptive variant of the FFM (Goldberg, 1993).

Despite the advances made in the proposed revisions for DSM-5, the present findings suggest that there are still significant limitations with the way in which these revisions have been conceptualized. First, psychopathy is currently not included in the preliminary draft revisions for DSM-5. While the initial DSM-5 proposal did include an "antisocial/psychopathic type" – the antisocial subtype intended to reflect secondary psychopathy (e.g., traits related to disinhibition and externalizing) and the psychopathic subtype intended to reflect primary psychopathy (e.g., traits related to boldness and meanness) – the current revision has relegated this diagnosis to merely an "antisocial (dyssocial) type" (APA, 2010). While this newly proposed antisocial type admittedly parallels the secondary variant of psychopathy, it is problematic in that it perpetuates confusion regarding the differential diagnosis of secondary psychopathy and APD. It also gives no diagnostic consideration to primary psychopathy as originally proposed by Cleckley (1941/1976).

Second, the recommended borderline and antisocial personality types are still considered conceptually distinct, despite sharing a high level of overlap in their proposed trait dimensions: antagonism (e.g., callousness, aggression, manipulation, hostility, deceitfulness) and disinhibition (e.g., irresponsibility, recklessness, impulsivity). In fact, the only trait rating upon which the borderline and antisocial types differ is with regard to the trait of negative affectivity, such that it is a proposed characteristic of the former but not the latter (Hicks & Patrick, 2006). This is problematic, as secondary psychopathic traits are actually associated with high levels of NEM (e.g., anger, stress reaction, alienation) (Hare, 1991; Miller et al., 2010; Schmitt & Newman, 1999); only primary psychopathic traits are associated with low levels of NEM (e.g.,

low stress reaction and anxiety). Given this evidence – as well as the findings from the current studies – DSM-5 would perhaps benefit from creating a "dysregulated" personality type (reflecting secondary psychopathy and BPD) to supplement a "psychopathic/callous" type (reflecting primary psychopathy). Such an approach would facilitate a movement towards classifying disorders on the basis of etiology as opposed to phenotypic manifestations (Hyman, 2007).

In addition to issues regarding the conceptualization and organization of psychopathy and BPD, the current studies also have implications regarding the assessment of these disorders. In particular, it is important to consider whether the assessment of F1 traits differs across genders (e.g., Vitale et al., 2002), as it is possible that the current findings are partly due to a measurement issue. That is, perhaps the way in which F1 is currently assessed *in women* does not distinguish well between the callous-unemotional behaviors observed in primary psychopaths versus those observed in individuals high in F2 traits or BPD. Given the measures currently available, the motives underlying these behaviors cannot be adequately distinguished. Accordingly, it is possible that F1 traits in woman are erroneously assumed to reflect psychopathic behaviors when, in fact, they truly reflect extreme dysregulation. Thus, more optimal measures of these phenotypes across genders may yield better distinctions between the callous and manipulative behaviors observed in primary psychopaths versus those in observed individuals with high F2 traits or BPD, especially among women. This distinction is important, as the callous and manipulative behaviors observed among women with BPD are likely of a qualitatively different nature (e.g., in terms of motives) than are those observed in primary psychopathy.

The present findings also support the integration of treatment techniques geared toward BPD and psychopathy, given that they are both presumed to represent manifestations of emotional dysregulation. For example, the utility of evidence-based treatments for BPD, such as Dialectical Behavior Therapy (DBT; Linehan, 1993; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), should be further explored for individuals with secondary psychopathy. A growing evidence base for DBT has demonstrated its efficacy in reducing BPD symptomology (e.g., Linehan et al., 2006; Lynch, William, Salsman, & Linehan, 2007) and, given the current results, may reduce destructive behaviors and emotions for women with secondary psychopathy as well (Berzins & Trestman, 2004). Indeed, a few existing treatment studies have examined the utility of DBT in forensic settings and produced promising findings, with evidence for reductions in anger, hostility, and violence among treated individuals, as well as increases in affect regulation and coping skills. These findings have been observed across male forensic patients with BPD (Evershed, Tennant, Boomer, Rees, Barkham, & Watson, 2004), impulsive-aggressive male and female inmates (Shelton, Sampl, Kesten, Zhang, & Trestman, 2009), and male and female youth with oppositional defiant disorder (Nelson-Gray et al., 2006). Despite the promise of these initial studies, more extensive work is needed to fully explore the efficacy of DBT with secondary psychopathy, as the majority of existing studies lack a treatment comparison group and/or waitlist control group. There also currently exists no formal manualization of DBT that has been modified for such populations. Similarly, more research is necessary to determine the efficacy of DBT in reducing the F1-related traits exhibited by women with BPD in particular, such as those involving deception, manipulation, and displays of shallow affect. Attention to the shared profiles of BPD and psychopathy in women may promote the development of new and integrated treatments that better address the complexity of these disorders in women.

Strengths, Limitations, & Conclusions

Although the current paper provides evidence regarding the complex relationship between the psychopathy factors, BPD, and emotional dysregulation across genders, there are nonetheless methodological limitations that must be taken into account. First, although the current results suggest that the relationship between psychopathy and BPD among women is accounted for by the broader construct of emotional dysregulation, the present analyses could not address the specific mechanisms behind this overlap. Future research would benefit from uncovering the neurophysiological mechanisms that are associated with the emotional dysregulation observed across these disorders in men versus women. For example, an abundance of work suggests that individuals with emotional and/or behavioral dysregulation exhibit disruptions in the frontolimbic regions involved in the implementation of emotional and inhibitory control (Davidson, 2002; Goldstein et al., 2007; Goodman, Triebwasser, Shah, & New, 2007; Völlm et al., 2004). In particular, there is evidence that emotion-related impairments in impulse control may stem from reduced functional connectivity between the prefrontal (e.g., orbitofrontal cortex, anterior cingulate cortex) and limbic (e.g., amygdala) regions. However, there is a still a dearth of work specifically examining whether these neural correlates may represent the emotional dysregulation observed among men and women with secondary psychopathy versus BPD, respectively. Such research would prove fruitful, as recent behavioral and electrophysiological work has found that individuals with borderline and secondary psychopathic traits exhibit deficits in inhibitory control that are further exacerbated under negative emotional contexts (e.g., Sprague & Verona, 2010; Verona, Sprague, & Sadeh, 2012).

Second, though the findings for Goal #1 were replicated across both a college and forensic sample, the forensic sample consisted only of women, which precluded comparisons

across genders. Future research would thus benefit from comparing both male and female prisoners, so as to extend and clarify the current results, although Study 3 included both male and female offenders residing in the community. Third, the effect sizes observed for the F1 × F2 interactions were small (i.e., accounting for an additional 1% of the variance in both Studies 1 and 2), albeit replicated in two samples. Fourth, the exclusive use of self-report data for the assessments in Study 1 may have been influenced by social desirability – though the use of clinician-rated variables in Study 2 limited the influence of social desirability. Relatedly, the use of self-report data in Study 1 also increases the possibility that the strong association observed between BPD and psychopathy in Study 1 (as compared to Study 2) may be partly attributable to method covariance. For instance, self-report method covariance may explain why F2 was associated with BPD at *both* high and low levels of F1 in Study 1 (albeit significantly more so for those high in F1), but only at high levels of F1 in Study 2. Given that the relative differences between high and low F1 groups across Studies 1 and 2 were similar in magnitude, it is possible that the use of self-report measures in Study 1 contributed to the subtle differences in findings across studies. The stark differences in sample characteristics of Study 1 versus Study 2 (e.g., normative college versus clinical forensic) may have also intensified this discrepancy.

Despite these limitations, Studies 1 and 2 provide important information regarding the relationship between BPD and psychopathy, and implicate the need for attention to potential gender differences in the manifestations of these disorders. Moreover, the results of Study 3 also implicate the need for etiologically-based classification systems in future versions of the DSM, given evidence that common vulnerability factors (e.g., emotional dysregulation) can give rise to seemingly distinct forms of personality pathology. Accordingly, these findings serve as an important starting place to examine similar or distinct etiologies for BPD and psychopathy in

men versus women and, moreover, can help inform re-conceptualization efforts so as to ensure the development of more parsimonious models of personality psychopathology in the DSM.

TABLES AND FIGURES

Table 1: *Study 1: Descriptive Statistics for Psychopathic and Borderline Personality Traits Across Men and Women*

Variables	Men (n = 156)		Women (n = 162)		
	M (SD)	Range	*M* (*SD*)	Range	*F*
PAI - Borderline Subscales					
PAI Affective Instability	5.8 (3.5)	0-17	6.4 (3.7)	0-18	2.31
PAI Identity Disturbance	7.2 (3.7)	1-21	8.6 (3.5)	0-18	**12.09****
PAI Negative Relationships	5.9 (3.1)	0-16	7.4 (3.9)	0-18	**12.63****
PAI Self-Harm	5.1 (3.1)	0-13	4.9 (3.5)	0-17	.21
SCATI - Borderline Total	8.6 (2.5)	5-17	9.1 (3.3)	5-23	2.15
PPI-S Factors					
PPI-S Fearless Dominance	57.6 (9.1)	35-81	52.6 (10.3)	29-78	**21.21****
PPI-S Impulsive Antisociality	57.0 (8. 5)	37-84	54.7 (9.3)	38-82	**5.26***
SRP-II Factors					
SRP-II Factor 1	34.3 (7.2)	16-53	30.4 (7.1)	14-50	**23.34****
SRP-II Factor 2	47.3 (10.7)	17-76	40.4 (11.7)	16-77	**29.58****

Note. PAI = Personality Assessment Inventory (Morey, 1991). SCATI = Short Coolidge Axis II Inventory (Coolidge, 2001). PPI-S = Psychopathic Personality Inventory-Short Form (Lilienfeld & Andrews, 1996). SRP-II = Self-Report Psychopathy Scales (Hare, 1991).

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

Table 2. *Study 1: Hierarchical Regression Analyses of Psychopathy Personality Facets and Gender in Predicting Borderline Personality Traits*

	Borderline Personality Traits					
Model	B	*SE B*	β	R^2	ΔR^2	ΔF
Step 1				.45	.45	**85.08****
Gender	.35	.08	.19**			
F1 Score	-.35	.05	-.34*			
F2 Score	.72	.05	.68**			
Step 2				.46	.01	2.39 †
F1 × F2	.04	.05	.04			
F1 × Gender	.06	.10	.09			
F2 × Gender	.23	.10	.36*			
Step 3				.47	.01	**4.68***
F1 × F2 × Gender	.21	.10	.31*			

Note. $N = 318$. F1 = Factor 1. F2 = Factor 2.

†$p<.10$, *$p<.05$, **$p<.01$

Table 3. *Study 2: Hierarchical Regression Analyses of PCL-R Psychopathy Facets Predicting BPD among Female Inmates*

	BPD					
Model	B	*SE B*	β	R^2	ΔR^2	ΔF
Step 1				.11	.10	**28.52****
F1 Score	.00	.04	.00			
F2 Score	.24	.04	.32**			
Step 2				.11	.01	**3.86***
F1 × F2	.24	.12	.09*			

Note. $N = 488$. BPD = Borderline Personality Disorder. F1 = Factor 1. F2 = Factor 2.

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

Table 4. *Study 3: Descriptive Statistics of Study Variables Across Men and Women*

Variables	Men (n = 309)		Women (n = 155)		F
	M (SD)	Range	*M* (*SD*)	Range	
Emotional Dysregulation					
Mood Lability	-0.1 (0.9)	-1.7-2.6	0.1 (.9)	-1.5-2.4	.28†
Hostility	18.5	6-39	19.5 (6.7)	5-40	.05
Reactivity in Relationships	8.8 (3.5)	0-18	10.6 (3.7)	2-18	**.30****
Emotional Aggression	62.9 (19.8)	40-157	63.3 (23.7)	33-157	2.42
Suicide-related Behavior	0.7 (1.7)	0-10	0.1 (1.8)	0-7	**18.43***
Externalizing Syndromes					
Alcohol Dependence	2.4 (2.3)	0-7	2.4 (2.4)	0-8	1.29
Drug Dependence	3.1 (2.4)	0-8	3.6 (2.6)	0-7	**7.04***
Antisocial Personality Disorder	4.2 (1.7)	0-7	3.3 (1.8)	0-7	**.70****
Conduct Disorder	3.7 (2.9)	0-14	2.0 (1.9)	0-10	**8.79****
Internalizing Syndromes					
Generalized Anxiety Disorder	0.2 (0.7)	0-3	0.5 (1.1)	0-3	**71.44****
Major Depressive Disorder	1.8 (3.0)	0-16	4.1 (4.0)	0-16	**9.03****
MASQ Anhedonic Depression	51.0 (15.1)	17-105	57.1 (16.4)	18-96	**1.86****
MASQ Anxious Arousal	27.0 (11.2)	6-67	29.2 (12.2)	11-62	**.16***
Psychopathy					
Factor 1	5.4 (2.7)	0-12	3.5 (2.2)	0-10	**10.66****
Factor 2	7.6 (2.6)	0-12	6.0 (2.7)	0-12	**1.68****

Note. Symptom counts were used for alcohol dependence, drug dependence, antisocial personality disorder, conduct disorder, generalized anxiety disorder, and major depressive disorder.

†p<.10, *p<.05, **p<.01

Table 5. *Study 3: Measurement and Structural Invariance Across the Four Competing Models of Emotional Dysregulation*

	Overall Fit Indices				
Model and Invariance Level	χ^2	*df*	CFI	RMSEA	AIC
Two-Factor Hierarchical					
Unconstrained Model	31.70	26	.995	.02	119.70
Constrained Model 1	34.76	31	.997	.02	112.76
Constrained Model 2	**78.05****	38	.97	.05	142.05
Constrained Model 3	**87.99****	45	.97	.05	137.99
Constrained Model 4	**89.82****	47	.97	.04	135.82
Developmental					
Unconstrained Model	31.14	24	.99	.03	123.14
Constrained Model 1	33.88	29	.996	.02	115.88
Constrained Model 2	**77.17****	36	.97	.05	145.17
Constrained Model 3	**85.46****	43	.97	.05	139.46
Constrained Model 4	**86.61****	44	.97	.05	138.61
Constrained Model 5	**87.23****	45	.97	.05	137.23
Two-Factor					
Unconstrained Model	30.49	22	.995	.03	126.49
Constrained Model 1	33.17	27	.97	.02	119.17
Constrained Model 2	**76.61****	34	.97	.05	148.61
Constrained Model 3	**84.12****	41	.97	.05	142.12
Constrained Model 5	**87.06****	44	.97	.05	139.06
One-Factor					
Unconstrained Model	31.14	24	.99	.03	123.14
Constrained Model 1	34.47	30	.996	.02	114.47
Constrained Model 2	**77.77****	37	.97	.04	143.77
Constrained Model 3	**86.61****	43	.97	.05	138.61

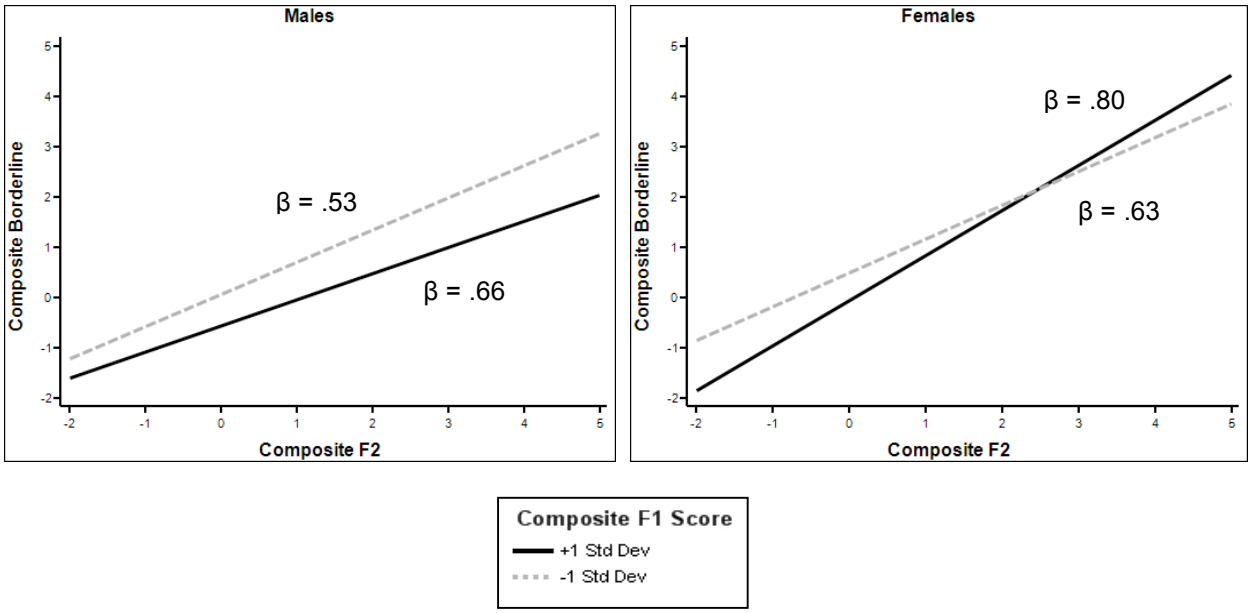
Note. χ^2= chi-square; *df* = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation. AIC = Akaike information criterion. *p<.05, **p<.01

Table 6. *Study 3: Correlations between Emotional Dysregulation and Internalizing/ Externalizing Psychopathology Separately in Men and Women*

	Emotional Dysregulation	
	Men (n = 309)	Women (n = 155)
Internalizing Syndromes	**.64****	**.67****
MDD	**.38****	**.42****
GAD	**.29****	**.34****
MASQ AD	**.51****	**.51****
MASQ AA	**.63****	**.64****
Externalizing Syndromes	**.51****	**.52****
AD	**.36****	**.31****
DD	**.32****	**.18***
APD	**.33****	**.37****
CD	**.46****	**.54****

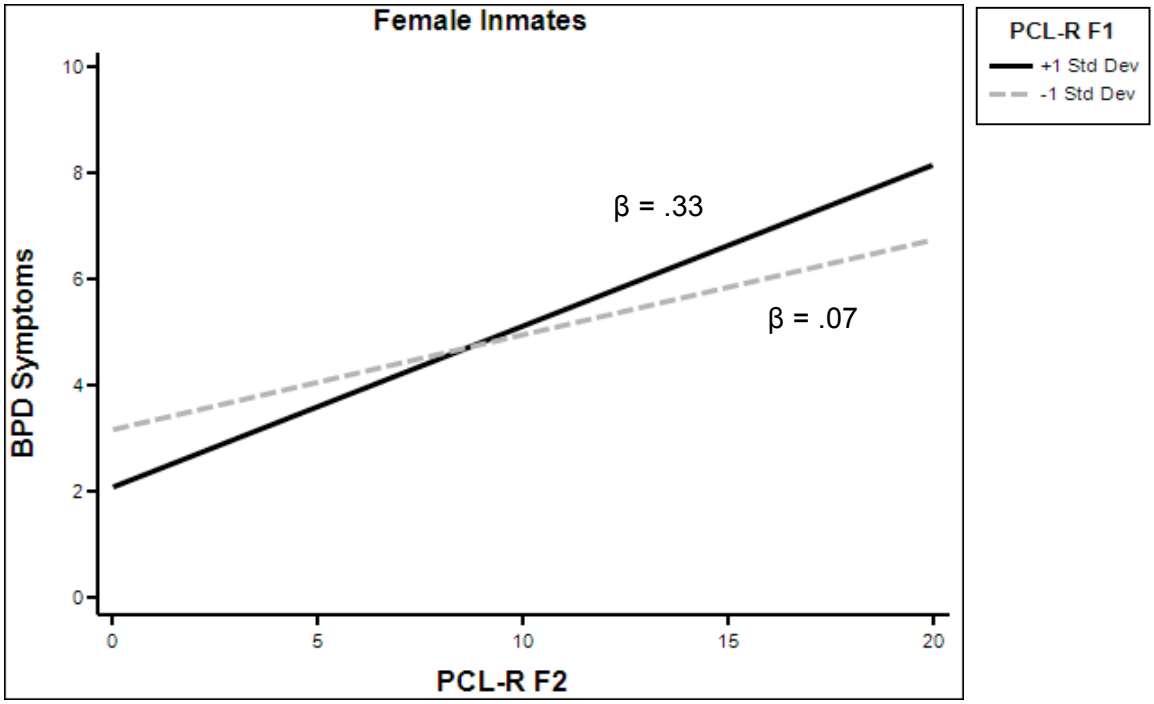
Note. *p<.05, **p<.01

Figure 1. *Study 1: Borderline Personality Symptoms as a Function of Psychopathic Personality Factors and Gender.*



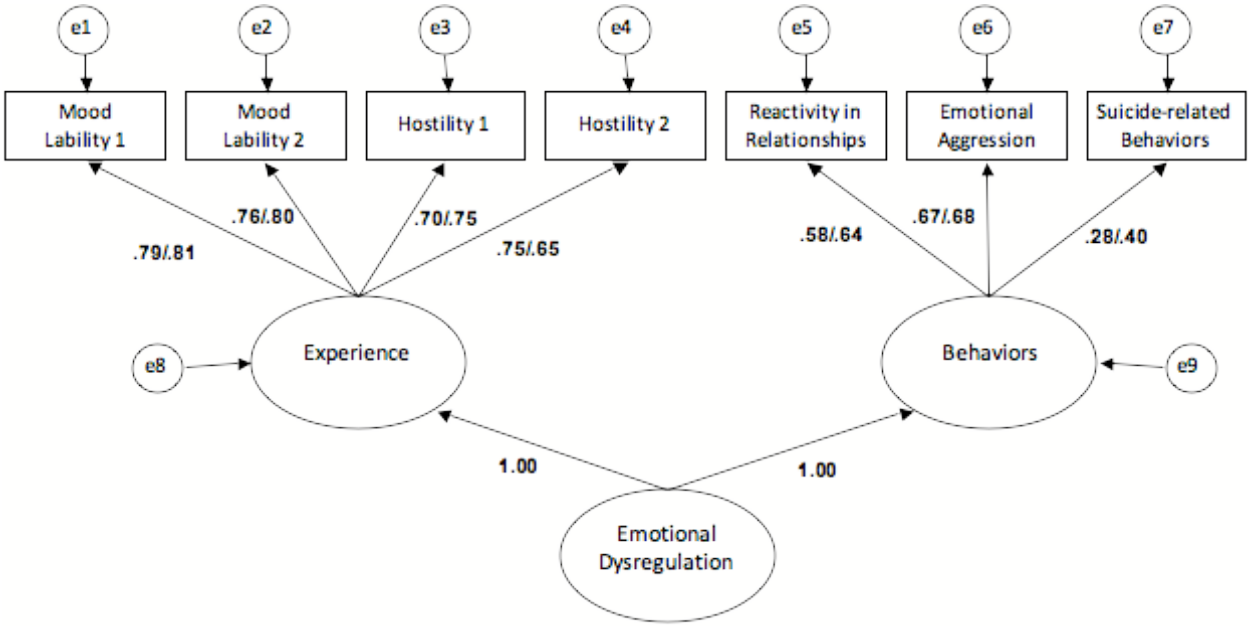
Note. The graph to the left represents males. The graph to the right represents females. F1 = Factor 1. F2 = Factor 2.

Figure 2. *Study 2: Borderline Personality Symptoms as a Function of Psychopathic Personality Factors among Female Inmates*



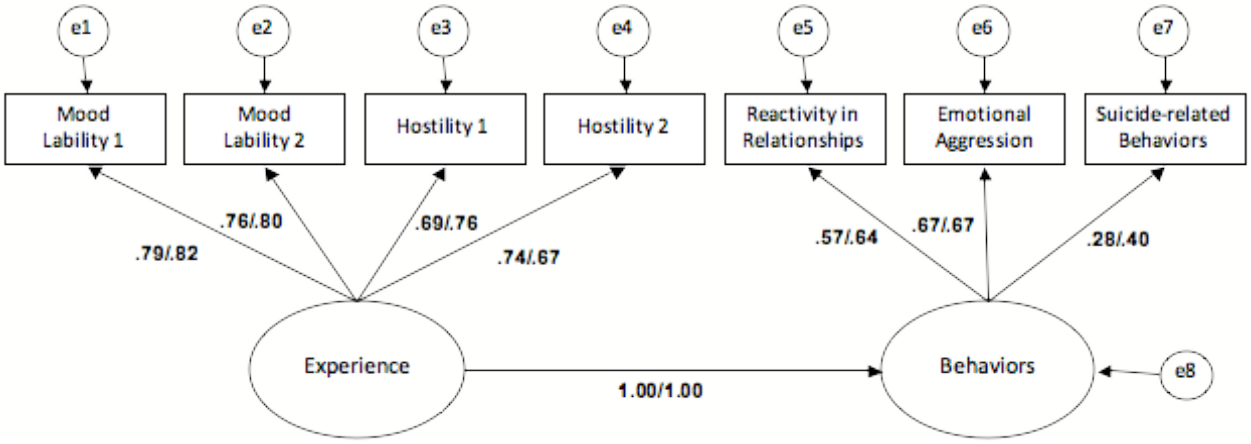
Note. F1 = Factor 1. F2 = Factor 2. PCL-R = Psychopathy Checklist-Revised (Hare, 2003).

Figure 3: *Study 3: Two-Factor Hierarchical Model of Emotional Dysregulation*



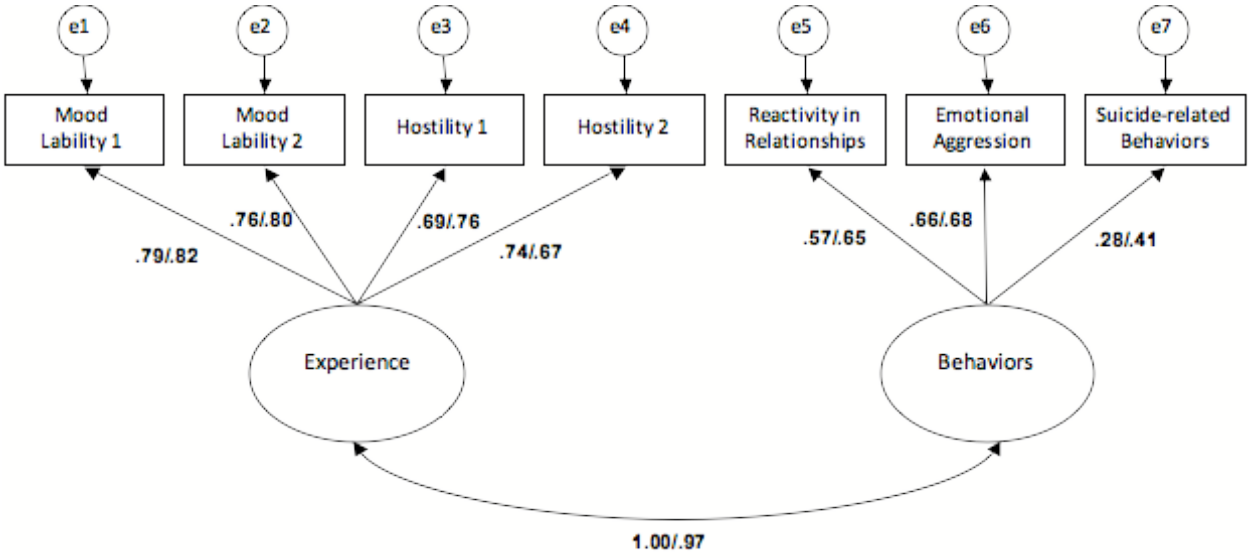
Note. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

Figure 4. *Study 3: Developmental Model of Emotional Dysregulation*



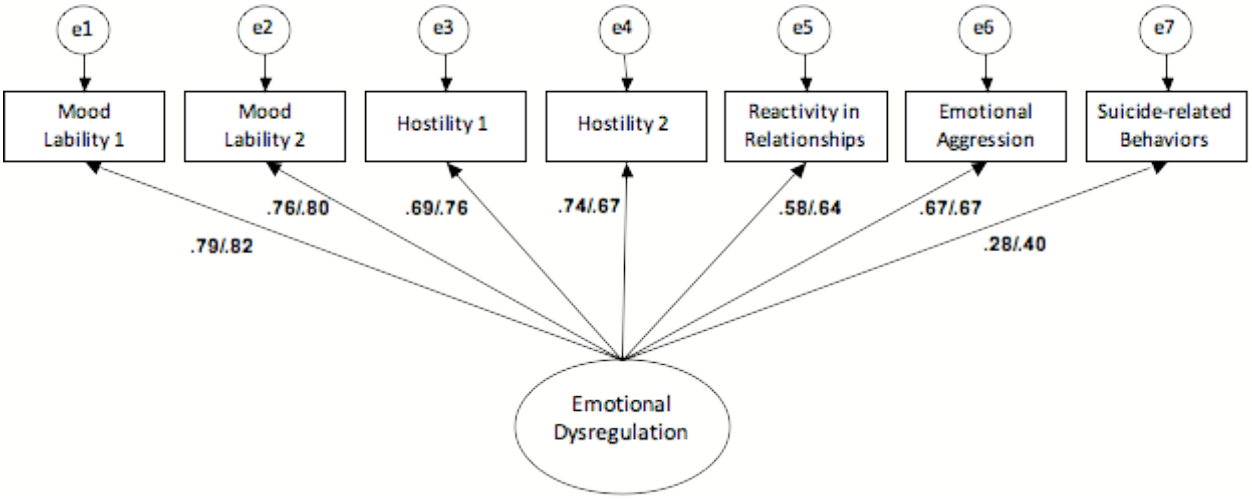
Note. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

Figure 5. *Study 3: Two-Factor Model of Emotional Dysregulation*



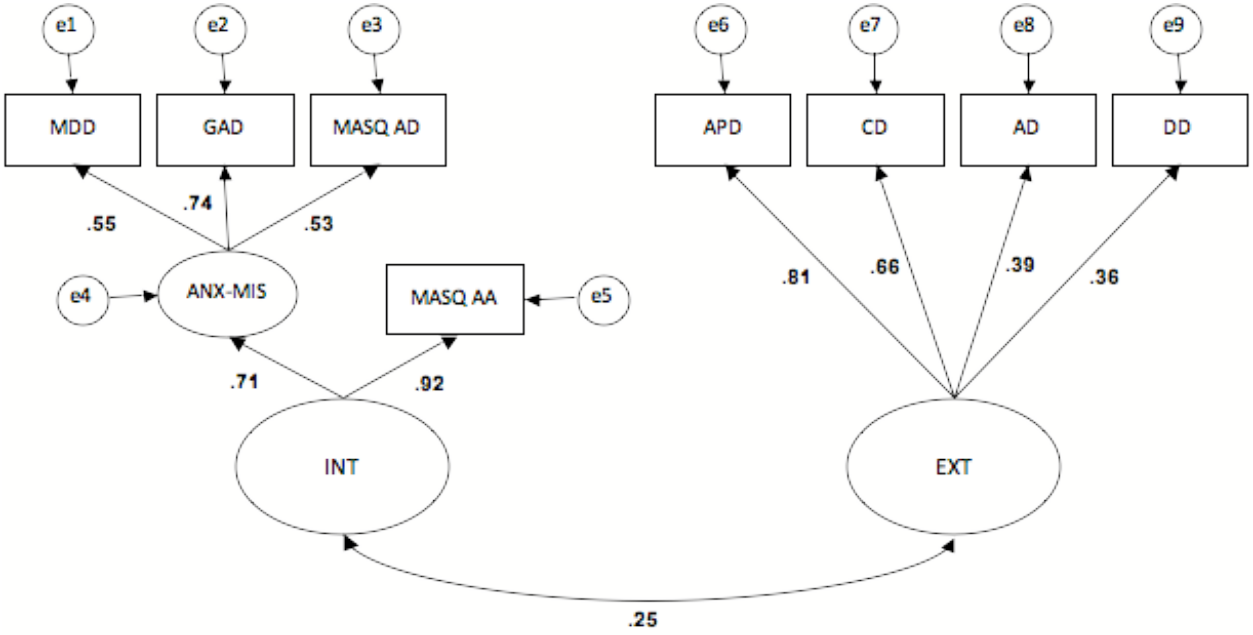
Note. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

Figure 6. *Study 3: Best-Fitting Model of Emotional Dysregulation: One-Factor Model*



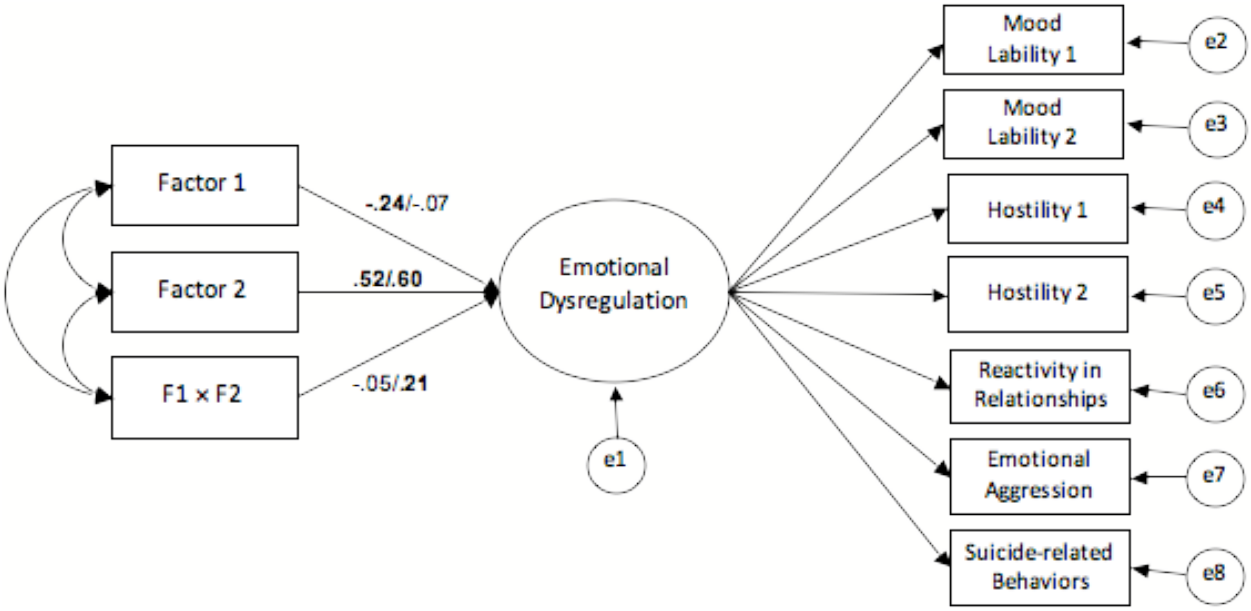
Note. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

Figure 7. *Study 3: Dimensional-Hierarchical Model of Psychopathology*



Note. AD = Alcohol dependence. ANX-MIS = Anxious-Misery. APD = Antisocial Personality Disorder. BPD = Borderline Personality Disorder. CD = Conduct Disorder. DD = Drug dependence. EXT = Externalizing. GAD = Generalized Anxiety Disorder. INT = Internalizing. MASQ = Mood and Anxiety Symptom Questionnaire (Watson et al., 1995). MASQ AA = Anxious arousal. MASQ AD = Anhedonic depression. MDD = Major depressive disorder. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

Figure 8. *Study 3: Structural Equation Model of the Two Psychopathy Factors and their Interaction in Predicting Emotional Dysregulation*



Note. F1 × F2 = interaction between Factor 1 and Factor 2. Estimates for men and women are shown to the left and right of the slash, respectively. Significant parameter estimates are in **bold** font.

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