The Application of an Etiological Model of Personality Disorders to Problem Gambling

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Abstract  Problem gambling is a significant mental health problem that creates a multitude of intrapersonal, interpersonal, and social difficulties. Recent empirical evidence suggests that personality disorders, and in particular borderline personality disorder (BPD), are commonly co-morbid with problem gambling. Despite this finding there has been very little research examining overlapping factors between these two disorders. The aim of this review is to summarise the literature exploring the relationship between problem gambling and personality disorders. The co-morbidity of personality disorders, particularly BPD, is reviewed and the characteristics of problem gamblers with co-morbid personality disorders are explored. An etiological model from the more advanced BPD literature—the biosocial developmental model of BPD—is used to review the similarities between problem gambling and BPD across four domains: early parent–child interactions, emotion regulation, co-morbid psychopathology and negative outcomes. It was concluded that personality disorders, in particular BPD are commonly co-morbid among problem gamblers and the presence of a personality disorder complicates the clinical picture. Furthermore BPD and problem gambling share similarities across the biosocial developmental model of BPD. Therefore clinicians working with problem gamblers should incorporate routine screening for personality disorders and pay careful attention to the therapeutic alliance, client motivations and therapeutic boundaries. Furthermore adjustments to therapy structure, goals and outcomes may be required. Directions for future research include further
research into the applicability of the biosocial developmental model of BPD to problem gambling.

**Keywords** Problem gambling · Personality disorder · Borderline personality disorder · Literature review

For most individuals, gambling is a source of entertainment and leisure that poses few risks to the individual’s wellbeing. However, there is a minority of individuals, approximately 2.3 % of the population, who experience significant financial, legal, psychological and health problems as a result of their gambling behaviour (Williams et al. 2012). According to the fifth edition of the diagnostic and statistical manual for mental disorders (DSM-5; American Psychiatric Association 2013), for individuals to be diagnosed with gambling disorder (previously known as pathological gambling), they must meet four of nine criteria. In contrast, the term problem gambling is often employed to refer to individuals who experience any harm as a result of their gambling behaviours (Neale et al. 2005).

Problem gambling is associated with a variety of negative consequences such as physical and psychological health problems, financial difficulties and occupational and social dysfunction (Productivity Commission 1999). Specifically, there is evidence that problem gambling is associated with a range of psychiatric disorders, such as mood disorders, anxiety disorders, and alcohol and substance use disorders (Dowling et al. 2011; Lorains et al. 2011). Moreover, there is emerging empirical evidence to show that problem gambling and personality disorders are highly co-morbid in both community and treatment-seeking studies (e.g., Blaszczynski and Steel 1998; Dowling et al. 2014a; Lorains et al. 2011; Pietrzak et al. 2007; Winslow et al. 2010).

The DSM-5 defines a personality disorder as ‘an enduring pattern of inner experience and behaviour that deviates markedly from the expectations of the individual’s culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time and leads to distress or impairment’ (American Psychiatric Association 2013, p. 645). Personality disorders are not formally diagnosed until an individual reaches adulthood, however most researchers suggest that personality disorder ‘traits’ are present during adolescence (Chanen et al. 2004). There are ten personality disorders listed in the DSM-5 in addition to personality disorder not otherwise specified. These ten personality disorders are grouped into three clusters: Cluster A personality disorders (paranoid, schizoid and schizotypal) which are characterized as odd or eccentric; Cluster B personality disorders (antisocial, borderline, histrionic and narcissistic) which are characterized as dramatic, emotional, or erratic; and Cluster C personality disorders (avoidant, dependent and obsessive–compulsive) which are described as anxious or fearful (American Psychiatric Association 2013). The World Health Organisation (WHO) World Mental Health Surveys of 21,162 respondents in the general community across 13 countries derived prevalence estimates of 6.1 % for any personality disorder, 3.6 % for Cluster A disorders, 1.5 % for Cluster B disorders, and 2.7 % for Cluster C disorders (Huang et al. 2009).

Although there are disparate results, borderline personality disorder (BPD) has been identified as one of the most common personality disorders among problem gamblers in both community and treatment seeking samples (Bagby et al. 2008; Dowling et al. 2011; Dowling et al. 2014a; Echeburua and Fernandez-Montalvo 2008). BPD is defined as ‘a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and
marked impulsivity beginning by early adulthood and is present in a variety of contexts’ (American Psychiatric Association 2013, p. 663). In order for an individual to be diagnosed with BPD, they must meet five of the nine criteria set out in the DSM-5.

The aim of this review is to summarise the literature exploring the relationship between problem gambling and personality disorders. In this review, we will (1) establish the co-morbidity of personality disorders, particularly BPD, in problem gamblers; (2) explore the characteristics of problem gamblers with co-morbid personality disorders, particularly co-morbid BPD; (3) review the similarities between problem gambling and BPD using an etiological model from the more advanced BPD literature; and (4) discuss the clinical implications of the relationship between problem gambling and personality disorders.

Co-morbidity of Personality Disorders in Problem Gamblers

There are a number of studies employing both community and treatment-seeking samples that report on the co-morbidity between problem gambling and personality disorders. Several studies have examined the co-morbidity between problem gambling and personality disorders using community samples (Bagby et al. 2008; Desai and Potenza 2008; Lorains et al. 2011; Pietrzak et al. 2007; Sacco et al. 2008; Vachon and Bagby 2009). A systematic review and meta-analysis of co-morbid disorders in population-representative samples of problem and pathological gamblers indicated a prevalence estimate of 29 % for antisocial personality disorders (Lorains et al. 2011). Some other studies reported a significant difference in the number of any personality disorders or personality disorder symptoms between problem gamblers and non-problem gamblers (Bagby et al. 2008; Pietrzak et al. 2007; Vachon and Bagby 2009). For example, in an epidemiological sample of 10,563 older adults, individuals diagnosed with pathological gambling (42.96 %) were significantly more likely to have a co-morbid personality disorder than non-pathological gamblers (7.3 %) (OR = 8.67) (Pietrzak et al. 2007). In another study of 228 community-recruited gamblers, non-pathological gamblers had significantly lower rates of personality disorders compared to pathological gamblers (Vachon and Bagby 2009). Similarly, Bagby et al. (2008) used a structured clinical interview and found that non-pathological gamblers had a significantly lower prevalence rate of any personality disorder than individuals with pathological gambling. Other studies using community samples have found significant differences between problem and non-problem gamblers on at least one specific personality disorder (Desai and Potenza 2008; Sacco et al. 2008). Desai and Potenza (2008) conducted an epidemiological study involving 43,093 individuals grouped into non-gamblers, low risk gamblers, at-risk gamblers and problem gamblers. A selection of personality disorders were examined (avoidant, dependent, antisocial, obsessive-compulsive, paranoid, schizoid and histrionic personality disorders). The authors found a ‘dose response’ whereby as the number of gambling problems increased so too did the likelihood of having any one of the personality disorders measured. Relatedly, Sacco et al. (2008) found that individuals diagnosed with BPD had significantly increased odds of having pathological gambling. Taken together, the findings from these community studies indicate that problem gamblers have elevated levels of personality psychopathology.

These relationships are also reflected in research employing treatment-seeking samples of problem gamblers (Blaszczynski and Steel 1998; Dowling et al. 2011; Dowling et al. 2014a; Echeburua and Fernandez-Montalvo 2008; Kroeber 1992; Kerber et al. 2008; Pelletier et al. 2008; Saez-Abad and Bertolin-Guillen 2008; Specker et al. 1996; Winslow et al. 2010). Across all of these studies, the overall prevalence rate for the presence of any
personality disorder ranges from 25% (Specker et al. 1996) to 93% (Blaszczyński and Steel 1998). A meta-analysis revealed that the mean prevalence estimate for any personality disorder was 47.9% (Dowling et al. 2011; Dowling et al. 2014a). Multiple studies comparing problem gamblers with healthy controls reported significant differences in the number of personality disorders between the two groups (Echeburúa and Fernandez-Montalvo 2008; Saez-Abad and Bertolini-Guillen 2008; Winslow et al. 2010). The variability seen in the prevalence of personality disorders among treatment-seeking problem gamblers may be attributable to methodological differences, such as the use of different measurement techniques (e.g., self-report vs. structured interview) (see: Bagby et al. 2008; Dowling et al. 2011; Echeburúa and Fernandez-Montalvo 2008) and characteristics of the sample being examined (e.g., community sample vs. treatment seekers) (see Bagby et al. 2008; Dowling et al. 2011; Dowling et al. 2014a).

Taken together, the evidence indicates that personality disorders are common among problem gamblers in the community and those seeking treatment for gambling problems. In many of the available studies, Cluster B personality disorders (Bagby et al. 2008; Blaszczyński and Steel 1998; Dowling et al. 2011; Dowling et al. 2014a; Echeburúa and Fernandez-Montalvo 2008; Krooiber 1992; Pelletier et al. 2008; Saez-Abad and Bertolini-Guillen 2008) were the most prevalent. Moreover, BPD was one of the most prevalent specific personality disorders (Blaszczyński and Steel 1998; Dowling et al. 2011; Echeburúa and Fernandez-Montalvo 2008; Saez-Abad and Bertolini-Guillen 2008). There is also evidence that rates of BPD are higher in problem gamblers than non-problem gamblers (Bagby et al. 2008; Sacco et al. 2008) and that BPD is a significant predictor of problem gambling (Sacco et al. 2008). It can therefore be cautiously concluded that Cluster B and BPD personality traits are commonly associated with problem gambling.

**Characteristics of Problem Gamblers with Co-morbid Personality Disorders**

Despite the high rates of co-morbid personality disorders among problem gamblers, there has been very little attention given to the characteristics of problem gamblers suffering from co-morbid personality disorders. Most of the studies that examine the profiles of problem gamblers with a co-morbid personality disorder are limited to antisocial personality disorder. These studies have found that problem gamblers with co-morbid antisocial personality disorder have an earlier onset of gambling behaviours, greater problem gambling severity, medical and substance use difficulties, higher levels of offending behaviour, and higher levels of paranoid ideation, somatisation, phobic anxiety and psychological distress than problem gamblers without antisocial personality disorder (Blaszczyński and McConaghy 1994; Pietrzak and Petry 2005). Ledgerwood and Petry (2010) classified their sample of treatment-seeking problem gamblers into three groups according to the three subtypes from the pathways model of problem gambling, one of which is characterised by antisocial personality disorder (Blaszczyński and Nower 2002). It was found that this cluster of problem gamblers were more likely to have a substance use or inpatient treatment history, a parent with a history of addiction or psychological problems, poorer emotional coping styles and higher problem gambling severity scores than behaviourally conditioned or emotionally vulnerable gamblers.

Few studies have profiled problem gamblers with personality disorders other than antisocial personality disorder. Blaszczyński and Steel (1998) found that problem gamblers with paranoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant or passive aggressive personality disorder had significantly higher levels of impulsivity than
those without a personality disorder. This study also found that, compared with problem
gamblers with no personality disorder, levels of anxiety were higher among problem
gamblers with schizotypal, borderline, histrionic, narcissistic and dependent personality
disorder and levels of depression were significantly higher among problem gamblers with
schizotypal, borderline, histrionic and dependent personality disorder. Furthermore,
Pelletier et al. (2008) found that problem gamblers with a co-morbid Cluster B personality
disorder were three times more likely to drop out of treatment than those without a co-
morbid Cluster B personality disorder. Taken together, these findings suggest that problem
gamblers with co-morbid personality disorders present with a more complicated clinical
picture than those without this form of co-morbidity. However, further research is required
to explore the characteristics of problem gamblers with personality disorders other than
antisocial personality disorder.

The Application of an Etiological Model of Personality Disorders to Problem
Gambling

Given the evidenced overlap between problem gambling and personality disorders, it is
reasonable to assume that an etiological model from the more advanced personality disor-
ders literature may serve as the foundation from which theoretical models relating to the
development and maintenance of problem gambling behaviour may emerge. Although there
are some exceptions, such as the pathways model of problem gambling (Blaszczynski and
Nower 2002) and Sharpe’s (2002) biopsychosocial model, the majority of research into
problem gambling is generally atheoretical. To date, much of the research has been dedi-
cated to conceptual debate, the identification of risk factors, and the evaluation of the
efficacy of various treatment modalities. However, the move towards theory-driven research
allows for the creation of hypotheses and provides a method to integrate related findings.

Although there are a number of explanatory models that account for the development of
personality disorders (e.g., Clarkin et al. 2007; Fonagy and Bateman 2008; Fruzzetti et al.
2005), the biosocial development model of BPD (Crowell et al. 2009) is an extensive
theoretical model of BPD that was empirically developed and is supported by a growing
body of literature (e.g., Ebner-Primer et al. 2007; Sauer and Baer 2009; Sturrock et al.
2009; Tragesser et al. 2007). In the following section, the similarities between problem
gambling and BPD are reviewed using the biosocial developmental model of BPD. This
model is described in detail, then the empirical evidence for the application of the core
constructs identified in the model to problem gambling is examined.

The Biosocial Developmental Model of BPD

The biosocial model of BPD was first described by Linehan in Linehan 1993. Crowell et al.
(2009) extended Linehan’s model to include the role of impulsivity, which is viewed as
one of three core features of BPD, and renamed it the biosocial developmental model of
BPD. A graphical depiction of the model can be found in Crowell et al. (2009).

There is both a child and parent component to the model. Factors specific to the child
include biological vulnerabilities such as a genetic vulnerability to BPD and neuroana-
tomical and neurotransmitter abnormalities. These vulnerabilities manifest within the child
as emotional sensitivity, proneness to impulsivity, and negative affect. Factors related to
the parent include invalidation of emotional responses, a lack of teaching the child how to
managing emotions adaptively, and inappropriate and inconsistent reinforcement of the expression of negative affect. According to the model, interactions between the child, the child’s environment, and the parent result in increasingly negative or ‘high risk transactions’ that predispose the child to emotion dysregulation. Emotion dysregulation includes high emotional sensitivity, intense responses to emotional stimuli, and a slow return to baseline. Psychopathology, such as depression, anxiety, and substance abuse is one outcome of emotion dysregulation. Another result of emotion dysregulation is that behavioural and cognitive reactions to emotional situations are also dysregulated, leading to distorted information processing, shutting down or freezing, an inability to control behaviour dependent on mood states, and difficulties organizing and achieving non-mood dependent goals. Over time, the cognitive, behavioural, and emotional dysregulation become ‘trait like,’ and are expressed as hopelessness, dissociation, disorganization, sadness, impulsive behaviour, and poor relationships. Although these ‘traits’ are maladaptive, they are the primary methods of emotion regulation and therefore become reinforcing leading to the emergence of the borderline personality.

The Application of the Core Constructs of the Biosocial Developmental Model of BPD to Problem Gambling

In this section, we will review the empirical and theoretical evidence for the applicability of the core constructs of the model to problem gambling. Following the structure of the model, this section will commence with high-risk transactions and move through to negative outcomes.

High-Risk Transactions

The biosocial developmental model indicates that high-risk transactions (i.e., interactions wherein the qualities of the parent and child lead to intense emotional displays and reinforcement of emotional instability) are the basis upon which vulnerabilities for BPD are built. As such, the combination of an impulsive and emotionally sensitive child, who is inclined to experience negative affect, and an invalidating parent who fails to reinforce appropriate emotional expression results in significant negative interactions between the parent and child (Crowell et al. 2009).

There has been considerable attention given to constructs conceptually related to the model’s high risk transactions that might lead to BPD. Crowell et al. (2009) present detailed evidence and outline the significance of high-risk transactions in the development of BPD. They offer a detailed exploration of early development factors such as child temperament (in particular, the presence of impulsivity and emotional sensitivity and vulnerability) and parental factors (parental invalidation of emotional expression, disrupted attachment, parental psychopathology and child maltreatment). For a more detailed discussion of the importance of high-risk transactions, see Crowell et al. (2009). Specifically, there is both theoretical (Fonagy and Bateman 2008) and empirical (Aaronson et al. 2006) literature suggesting that disrupted attachment (an affectional bond between a child and its caregiver) is a core feature of BPD. There is also empirical evidence for other aspects of high-risk transactions in the development of BPD such as child abuse and maltreatment (Elzy 2011; Gratz et al. 2011; Igarashi et al. 2010), parental invalidation (Sturrock et al. 2009) and parental mental illness (Bandelow et al. 2005; Trull 2001). Taken together, the evidence suggests that high-risk transactions are likely contribute to the development of
BPD. However, a limitation of the BPD research is that it comprises cross-sectional studies and a direction for future research is the need for longitudinal studies to draw out any causal relationships between these variables.

In contrast, there are few studies investigating high-risk transactions in the childhoods of problem gamblers. Recent studies have investigated the association of problem gambling severity and childhood maltreatment, which can be conceptualised as a high-risk transaction. There is evidence that self-reported childhood maltreatment is significantly higher among problem gamblers than non-problem gamblers (Felsher et al. 2010; Hodgins et al. 2010). Relatedly, a review of childhood sexual abuse, a specific form of childhood maltreatment, in problem gambling concluded that despite methodological variations between studies, the experience of childhood sexual abuse is related to gambling problems (Dion et al. 2010).

Further, several studies have found that less secure attachment quality is associated with gambling problems (Grant and Kim 2002; Magoon and Ingersoll 2006). Grant and Kim found that compared to controls, pathological gamblers retrospectively reported significantly lower rates of optimal parenting associated with secure attachment (i.e., high parental care and low parental overprotection) and higher rates of neglectful parenting associated with insecure attachment (i.e., low parental care). Similarly, in a younger sample (116 high school students), secure attachment was significantly correlated with less gambling behaviour and insecure attachment and poor communication was associated with increased gambling behaviour (Magoon and Ingersoll 2006). Taken together, the findings of these studies suggest that problem gambling is associated with dysfunctional early parent–child interactions, such as poor attachment, abuse and maltreatment. This limited evidence lends credence to the importance of high-risk transactions in the development of problem gambling and the need for further research into this emerging area.

Difficulties in Emotion Regulation

In the model, difficulties in emotion regulation (i.e., the ability to access and modulate the experience of an emotion) are conceptualised as emerging from high-risk transactions. Problem gambling and BPD share a common theme of low levels of adaptive emotion regulation. There is a strong consensus that emotion regulation difficulties are a core feature of BPD (Johansen et al. 2004; Koenigsberg et al. 2001). According to the biosocial development model, emotion dysregulation consists of the following three features: (1) heightened emotional sensitivity (an extreme or intense emotional reaction not in proportion to the situation), (2) an inability to regulate intense emotional responses (difficulties self-soothing and managing emotions), and (3) a slow return to baseline (the effects of an emotional reaction last for a relatively long time) (Crowell et al. 2009).

Because a significant literature agrees that emotion dysregulation is a key feature of BPD, only a brief sample of the recent papers is presented in this review. Studies providing evidence of emotion regulation difficulties in individuals with BPD tend to fall into three categories: (1) studies using self-report measures of emotion dysregulation, (2) studies using day-to-day records of the presence/absence and intensity of specific emotions, such as anxiety and anger, and (3) studies using physiological recordings, such as heart rate and skin conductance. Based upon self-report data, Glenn and Klonsky (2009) found that emotion dysregulation was significantly correlated with BPD symptoms, even after controlling for depression, anxiety and negative affect and concluded their findings supported the notion that emotion dysregulation is a core feature of BPD (see also Reeves et al. 2010; Tragesser and Robinson 2009). Studies comparing the type, frequency and intensity of self-
reported emotions either over a specified period of time or after an emotion induction have yielded inconsistent results. However, the general conclusion from the findings of these studies is that individuals with BPD tend to have either a higher frequency or stronger intensity of negative emotions than controls (Gratz et al. 2010; Jacob et al. 2009; Kuo and Linehan 2009; Trull et al. 2008). Evidence from physiological studies are somewhat less conclusive. Ebner-Primer et al. (2007) found that patients with BPD had a significantly higher heart rate across a 24-h assessment period, after adjusting for exercise levels, compared to healthy controls. Although Kuo and Linehan (2009) found that patients with BPD had higher rates of baseline skin conductance (an indication of physiological arousal) and lower rates of baseline respiratory sinus arrhythmia (higher rates are associated with relaxed states), they found no differences between the BPD and control groups on these measures after an emotion induction. The interpretation of these results was that individuals with BPD are biologically vulnerable to emotion dysregulation, but that this dysregulation is accounted for by a high rate of baseline emotional intensity rather than actual emotional reactivity. In summary, both the theoretical and empirical literature support emotion dysregulation as a core feature of BPD.

In contrast, there is only a small literature pertaining to emotion dysregulation in problem gambling, although there is general acceptance that gambling may be an attempt, albeit dysfunctional, to regulate aversive emotions (Blaszczynski and Nower 2002). Several studies have examined emotion regulation among problem gamblers (de Lisle et al. 2014; Lee et al. 2008; Ricketts and Macaskill 2003). In samples of treatment-seeking problem gamblers, de Lisle et al. (2014) found that emotion dysregulation was significantly associated with psychological distress, and that multiple indices of distress tolerance were significantly associated with psychological distress, gambling pre-occupation, and problem gambling severity. Lee et al. (2008) found, in a sample of 89 Korean pathological gamblers, that a factor emerged during an analysis of demographic and clinical variables that was a combination of depression, anxiety, impulsivity, and gambling symptom severity. While the interpretation of a factor analysis is subjective, the combination of the variables making up the factor labelled emotional instability indicated difficulties with emotions and engagement in gambling behaviours to relieve negative affective states (Lee et al. 2008). Relatedly, in a qualitative analysis of treatment seeking pathological gamblers, one of the three main themes was the notion of gambling as an emotion management strategy (Ricketts and Macaskill 2003).

Several studies have also identified emotion modulation as a motivating factor to engage in gambling behaviour (Christensen et al. 2013; Clarke 2008; Francis et al. 2014; Stewart et al. 2008; Thomas et al. 2009). Gambling to reduce negative mood states or to improve positive emotions is a common finding among these studies. For example, in a study involving a population representative sample (Francis et al. 2014), a factor analysis revealed five motivational factors: regulation of internal states, money, positive feelings, social, and challenge reasons. Regulation of internal state motives were associated with regular gambling, problem gambling severity, and a higher number of gambling activities. Other researchers have reported very similar results (Clarke 2008; Stewart et al. 2008; Thomas et al. 2009). Taken together, these findings suggest that problem gamblers experience difficulties regulating their emotions and may use gambling as a strategy to manage negative emotions. While these results suggest that, consistent with the biosocial development model, difficulties with emotion regulation are an important factor related to problem gambling, caution should be exercised in drawing any firm conclusions. There is only a small literature supporting this contention and further methodologically sound studies involving larger numbers of participants are required.
Comorbid Psychopathology

In the model, co-morbid psychopathology such as mood and anxiety disorders and substance use are seen as additional outcomes of emotional regulation difficulties which serve to further exacerbate emotional dysregulation. Individuals with BPD or problem gambling show heightened levels of these disorders, including substance use problems, mood disorders (depression) and anxiety disorders.

Alcohol and Substance Use Disorders

In general, the association between personality disorders and substance use is quite compelling. In their review, Straussner and Nemenzik (2007) found that compared to the general population individuals with an alcohol use disorder had significantly higher levels of personality pathology and this increased even further among those individuals with an opioid disorder. More specifically, BPD is linked to substance abuse as evidenced by Torrens et al. (2011), who found that having BPD significantly increased the odds ratio of having a substance use disorder. Notably, Zanarini et al. (2010) found that substance use disorders were significantly higher among in-patients with BPD than individuals with any other personality diagnosis.

There is also evidence linking problem gambling and substance abuse across diagnostic, clinical, physiological and behavioural domains (see Wareham and Potenza 2010). Multiple large studies have found significantly higher levels of alcohol and drug use problems in problem gamblers compared to those with low or no risk problem gambling (Barry et al. 2011; Martins et al. 2010). Other research suggests that alcohol and drug use problems are significantly correlated with problem gambling severity (Griffiths et al. 2010) and that alcohol use increases the likelihood of gambling severity (Huang et al. 2011). Recent meta-analyses (Dowling et al. 2011; Lorains et al. 2011) provides compelling evidence for the relationship between substance use problems and problem gambling in both population-representative and treatment-seeking samples of problem gamblers. In population-representative samples, the most common co-morbid condition was nicotine dependence (60.1 %) followed by substance use disorder (57.5 %) (Lorains et al. 2011). There are also high rates of any alcohol or substance use disorder (22.2 %), any alcohol use disorder (21.2 %), and any substance (non-alcohol) use disorder (7.0 %) in samples of treatment-seeking problem and pathological gamblers.

Mood Disorders

Depression is commonly co-morbid among both BPD and problem gambling and the findings mirror those for substance use. Symptoms of BPD are correlated with symptoms of depression (Coid et al. 2009; Walter et al. 2009). Moreover, the findings of a prospective study revealed that the presence of BPD was associated with more relapses of major depression than the presence of other personality disorders (Gunderson et al. 2008). Further, significantly greater depression severity was found among those with more severe BPD than those with less severe levels (Bornovalova et al. 2010).

In 2006, an extensive review of the literature concerning problem gambling and mood disorders concluded that there is a strong link between mood disorders and problem gambling (Kim et al. 2006). This is supported by the findings of meta-analyses concluding that problem gamblers in the community (37.9 %) (Lorains et al. 2011) and samples of treatment-seeking problem and pathological gamblers (23.1 %) (Dowling et al. 2011) have...
high rates of mood disorders. A study by Dussault et al. (2011) aimed at untangling the direction of causality between the experience of depression and problem gambling by conducting a longitudinal study. They found that gambling problems at age 17 predicted future depressive symptoms and that depressive symptoms at age 17 predicted future gambling problems. The authors concluded that the two disorders might mutually influence each other.

Anxiety Disorders

Anxiety symptoms and disorders are common among individuals with BPD. Bornovalova et al. (2010) found that in addition to depression, anxiety disorders are also associated with increasing severity of BPD. Other studies have reported similar results, either finding significant correlations between anxiety (symptoms or disorders) and BPD (Coid et al. 2009) or finding significant differences in the level of anxiety (symptoms or disorders) when comparing a BPD group with a non-BPD group (Black et al. 2007; Stepp and Pilkonis 2008).

Although the relationship between anxiety and problem gambling has not been as extensively investigated as the relationship between depression and problem gambling, empirical evidence indicates that anxiety is prominent among problem gamblers (Barry et al. 2011; Dowling et al. 2011; Hopley and Nicki 2010; Lorains et al. 2011). The meta-analysis of Lorains et al. (2011) identified anxiety disorders as having a high co-morbidity (37.4 %) among problem gamblers. Similarly, Dowling et al. (2011) found that 17.6 % of treatment-seeking problem and pathological gamblers reported any anxiety disorder, with the highest estimates for social phobia (14.9 %), generalised anxiety disorder (14.4 %), panic disorder (13.7 %), and post-traumatic stress disorder (12.3 %).

In summary, this section has reviewed literature that provides strong support for the occurrence of BPD and problem gambling and their mutual co-morbidities of substance use disorders, depression, and anxiety disorders. This evidence sets the stage for the following discussion of negative outcomes found for those experiencing BPD and problem gambling.

Negative Outcomes

The biosocial developmental model proposes that negative outcomes across multiple domains contribute to the development of BPD (Crowell et al. 2009). These domains include: (1) the social domain, which includes the negative outcomes of social isolation, problematic peer relationships and ineffective individuation from the parent; (2) the cognitive domain, which includes the negative outcomes of low self-efficacy, self-hatred, hopelessness, disorganization and dissociation; (3) the emotional domain, which includes the negative outcomes of generalized emotional vulnerability, sadness, shame and anger; and finally, (4) the behavioural domain, which includes the negative outcomes of withdrawal, avoidance and frequent impulsive behaviours. It is beyond the scope of this paper to review all the evidence for every aspect of each domain for both BPD and problem gambling (see Crowell et al. (2009) for a more in depth coverage of each of these areas in the context of the model). A sample of the evidence will therefore be presented for each domain in order to highlight the fact that BPD and problem gambling share similar associated factors.
Negative Social Outcomes

There is a large literature examining various aspects of interpersonal difficulties experienced by individuals with BPD. For example, social isolation and problematic peer relationships are indicated by findings that individuals with BPD experience fewer social interactions and their social interactions tend to be associated with more negative emotions than healthy controls (Stepp et al. 2009). A longitudinal study of the interpersonal features of BPD (Choi-Kain et al. 2010) found that certain types of interpersonal difficulties, such as affective consequences when alone, fear of abandonment, discomfort with care and dependency (labelled as ‘affectively-oriented facets of interpersonal experience’) (p. 372) were more resistant to improvement than other aspects of interpersonal difficulties, such as recurrent break ups, demandingness and boundary violations.

Although there has been much less emphasis on the interpersonal difficulties of problem gamblers, there is a small body of literature to suggest that problem gamblers also experience negative social outcomes. In a Dutch sample of 851 adolescents, social competence and loneliness were significant predictors of pathological gambling 6 months later (Lemmens et al. 2011). Similarly, Dowling and Brown (2010) found that problem gambling severity was associated with loneliness in a sample of young adults after controlling for relevant socio-demographic factors. There are also findings that social alienation is a significant predictor of problem gambling in adults (Delfabbro et al. 2006) and that pathological gamblers experience significantly more social and familial discord than non-pathological gamblers (Dowling et al. 2009; Pietrzak and Petry 2005).

Negative Cognitive Outcomes

Both individuals with BPD and problem gambling experience negative outcomes in the cognitive domain. A variety of empirical studies have found that individuals with BPD show heightened levels of hopelessness (Berk et al. 2007) and lowered self esteem (Zeigler-Hill and Abraham 2006). Transitory dissociative experiences are a diagnostic criterion for BPD (American Psychiatric Association 2013) and although the relationship between BPD and dissociation has not been fully untangled, a large number of empirical studies find these two variables are associated (Korzekwa et al. 2009; Ross 2007; Zanarini et al. 2008) For example, a comparison of inpatients with or without BPD revealed that the patients with BPD scored significantly higher on a measure of dissociative experiences than those without BPD (Wingenfeld et al. 2010).

Negative cognitive outcomes are also experienced by individuals with gambling problems. Several empirical studies have shown an association between problem gambling and dissociative experiences (e.g., Hopely and Nicki 2010; Wanner et al. 2006). For example, a study of 1,351 Norwegian adolescents revealed that the use of gambling to dissociate was a significant predictor of problem gambling scores (Molde et al. 2009). However, as Grant and Kim (2003) point out, there is still debate as to whether dissociation is limited to gambling only situations. Finally, several studies have found negative cognitive outcomes such as self-esteem and self-efficacy among problem gamblers (Casey et al. 2008; Delfabbro et al. 2006; Kaare et al. 2009; Lemmens et al. 2011). For example, Delfabbro et al. (2006) found that individuals classified as problem gamblers had significantly lower scores on the Rosenberg self-esteem scale than those classified as non-problem gamblers.
**Negative Emotional Outcomes**

Negative emotional outcomes are well documented among individuals with BPD. Recent studies have found that anger is a predictor of BPD symptoms (Morse et al. 2009) and is prolonged among individuals with BPD compared to healthy controls (Jacob et al. 2008). Moreover, inappropriate and intense anger or difficulty controlling anger is a diagnostic criterion for BPD (American Psychiatric Association 2013). In a study of perceived emotions across a 24-h period, individuals with BPD experienced more persistent sadness and were more likely to oscillate between sadness, anxiety and anger, than healthy controls. Finally, a recent study found that individuals with BPD display greater levels of shame that persist for longer after a negative evaluation compared to healthy controls (Gratz et al. 2010).

Although there is considerably less research examining the negative emotional outcomes for problem gamblers, there is evidence to show that emotional vulnerability, anger and shame are also negative outcomes for problem gamblers. In a study of intimate partner violence, it was found that almost 65% of problem gamblers reported problems with anger that placed them in the clinically significant range (Korman et al. 2008). Furthermore, Cunningham-Williams et al. (2009) examined withdrawal type symptoms among problem gamblers and found that a model including guilt, disappointment and anger was the best model in explaining problem gambling severity. A study conducted by Yi and Kanetkar (2011) utilized structural equation modelling to find that shame was more strongly correlated with problem gambling severity than guilt and that the intensity of shame significantly mediates the relationship between problem gambling severity and the use of avoidant coping. The interpretation of these results by the authors was that shame is a central emotion experienced by problem gamblers and that problem gamblers often utilize avoidant coping strategies in an attempt to manage this emotion. The negative outcome of emotional vulnerability has also been identified among problem gamblers. Turner et al. (2008) tested the pathways model of pathological gambling using a principle components analysis. Their results revealed four distinct factors, of which emotional vulnerability, as measured by negative life events, depression, anxiety and social anxiety and ways of coping, had the largest effect. In summary, it can be concluded from the evidence presented that both problem gamblers and individuals with BPD experience a variety of negative emotional outcomes.

**Negative Behavioural Outcomes**

The final domain of negative outcomes proposed by the biosocial developmental model includes negative behavioural outcomes. Impulsivity is considered a core feature of BPD (Crowell et al. 2009). The impulsive behaviours of individuals with BPD tend to be troubling for clinicians. These include self-injury, suicide attempts, binge drinking, and risky sexual behaviours (Crowell et al. 2009; Linehan 1993). The attempted and completed rate of suicide among individuals with BPD is higher than other psychological disorders (Black et al. 2004).

There is also considerable literature examining the relationship of impulsivity with problem gambling. Both self-report and experimental methods have been utilized to investigate this relationship. Delay discounting paradigms, whereby an individual is required to choose between two monetary amounts, a smaller amount after a shorter delay, or a larger amount after a more extended delay, have been utilized in problem gambling and BPD samples. Although this paradigm is used rarely in BPD research, higher trait
impulsivity and preference for immediate rewards in a delay discounting task were found in a BPD sample (Lawrence et al. 2010). Petry (2001) found that pathological gamblers discount delayed rewards (i.e., chose the smaller reward after a short period of time rather than the larger reward after a longer period of time) at a significantly higher rate than non-pathological gamblers. Fuentes et al. (2006) found that pathological gamblers reported significantly higher levels of impulsivity on the Barratt Impulsiveness Scale than a control group. Lorains et al. (2014) found that while treatment-seeking problem gamblers were not more impulsive on laboratory inhibitory control measures than a control group, they were more likely to demonstrate elevated self-reported impulsivity. Other negative behavioural outcomes related to impulsivity, such as suicide (Maccallum and Blaszczynski 2003) and inter-personal violence (Cunningham-William et al. 2007; Dowling et al. 2014b; Korman et al. 2008; Suomi et al. 2013) are also experienced by problem gamblers.

Clinical Implications

The findings from this literature review have several implications for clinical practice. The fact that problem gamblers have high levels of co-morbid psychopathology indicates a need to undertake routine and systematic screening and assessment of problem gamblers presenting to treatment facilities. This could be achieved through comprehensive screening for multiple personality disorders or targeted screening of specific personality disorders (Dowling et al. 2014a). Furthermore the presence of a co-morbid personality disorder is likely to complicate the clinical picture and any subsequent interventions provided. The presence of a personality disorder may alert clinicians to potential difficulties in treatment such that clinicians may need to set stringent behavioural limits, lower their expectations of treatment motivation and be more tolerant of poor compliance, encourage treatment adherence and expect longer term treatment (Dowling et al. 2014a). The findings from this review also have implications for the treatment of problem gambling. Currently, there are a diverse range of options for the treatment of problem gambling, with varying levels of empirical support. A Cochrane review (Cowlishaw et al. 2012) provides some evidence for the efficacy of cognitive-behavioural therapies (CBT) and motivational interviewing (MI) for the treatment of problem gambling. Although the studies on which these conclusions are based provide generally low quality standards of evidence and no treatment satisfies the standards for classification as an empirically supported intervention (Chambless and Hollon 1998), an evidence-based clinical practice guideline (Thomas et al. 2011) has recommended the use of these interventions for the treatment of problem gambling. These interventions, however, do not work for all problem gamblers and relapse rates can be relatively high (Cowlishaw et al. 2012; Thomas et al. 2011). Moreover, the findings from this review suggest that problem gamblers with a co-morbid personality disorder present with a more complicated clinical picture than those without comorbid personality disorder. It is therefore likely that treatment compliance is likely to be negatively affected by the presence of a personality disorder. Blaszczynski and Steel (1998) recommend that clinicians pay attention to factors affecting compliance, such as levels of motivation, limit setting, therapy structure and the therapeutic relationship, and alter individual treatment goals and outcome objectives accordingly. Taken together, these findings suggest that a subset of problem gamblers, particularly those with comorbid personality disorders, may benefit from other interventions. The highlighting of a number of similarities between BPD and problem gambling has created the basis upon which to assert the application of the
biosocial developmental model of BPD to problem gambling. The use of this model not only provides a theoretical understanding of problem gambling, but suggests that Dialectical Behaviour Therapy (DBT), a treatment built on the theoretical foundations of the biosocial developmental model of BPD may be useful in the treatment of problem gambling. DBT is considered to be a “third-wave” CBT intervention. These interventions are characterized as expanding upon the CBT tradition by incorporating eastern approaches to the mind and body within a cognitive-behavioural framework (Hayes et al. 2004). DBT comprises of four core skill sets that clients are taught and encouraged to develop: mindfulness, distress tolerance, emotion regulation and interpersonal effectiveness (Linehan 1993). A number of studies have shown DBT to be effective in treating aspects of BPD (Carter et al. 2010; Linehan et al. 2006; McMain et al. 2009). A small number of papers have also investigated the use of modified DBT interventions for problem gambling Christensen et al. (2013); Korman et al. 2005). For example, Christensen et al. (2013) provide a detailed review of the use of modified DBT for problem gamblers and report on their study in which a small sample of ‘treatment resistant’ problem gamblers were provided with 9 weeks of a modified DBT program. The findings revealed reductions in gambling behaviour, whereby 83 % were abstinent or reduced their gambling from pre- to post-treatment evaluations. Psychological distress also reduced significantly across the course of the project. This study also explored the degree to which the four core DBT processes (mindfulness, distress tolerance, emotion regulations, and interpersonal effectiveness) improved as a function of the DBT intervention. The findings revealed clinical and statistical improvements in mindfulness and distress tolerance. Korman et al. (2008) randomly assigned 42 problem gamblers with co-morbid anger problems, half of whom also had substance problems, to 12 weeks of modified DBT or 12 weeks of CBT. Participants receiving DBT were less likely to drop out and reported significantly less gambling and less anger post-baseline. Although both treatments showed significant reductions in gambling and anger, only the DBT showed significant reductions in substance use. These results are promising and suggest that DBT may be effective treatment for a subgroup of problem gamblers. Moreover, other third-wave interventions with an heavier emphasis on mindfulness, are receiving increasing attention in the problem gambling treatment outcome literature (de Lisle et al. 2011, 2012, 2014; Shonin et al. 2013a, b, 2014; Toneatto et al. 2007). There is now evidence to suggest that several mindfulness-based psychotherapies, such as mindfulness-based cognitive therapy (MBCT) and meditation awareness training (MAT) may improve both gambling and other therapeutic outcomes for problem gambling (de Lisle et al. 2011; Shonin et al. 2014; Toneatto et al. 2007). For example de Lisle et al (2011) provided a course of MBCT for a female problem gambler. They found that following treatment with MBCT, the participant had abstained from gambling post-treatment and also evidenced significant reductions in anxiety and depression post-treatment. Taken together, these findings suggest that DBT and other “third wave” CBT interventions show promising results in the treatment of problem gambling. Given that these interventions work on different mechanisms to CBT and MI, they may be effective for a subgroup of problem gamblers who have not responded to CBT and MI. It is clear that further research into the effectiveness of DBT and other “third wave” interventions for the treatment of problem gambling and for whom these interventions are most effective is required.
Conclusions

A number of conclusions can be drawn from this review. Firstly, it has been shown that there are similarities between individuals presenting with problem gambling and personality disorders, and in particular BPD. High levels of personality disorder co-morbidity are clearly evident among both community and treatment seeking problem gamblers, with BPD being one of the more prevalent personality disorders. Moreover, problem gamblers with a comorbid personality disorder present with a more complicated clinical picture, including greater problem gambling severity, higher treatment dropout rates and other associated problems such as anxiety, depression and impulsivity. Given these conclusions, we used the biosocial developmental model of BPD to examine similarities between problem gambling and BPD. The two disorders were found to share similarities in psychological factors such as poorer parent-child interactions, emotion dysregulation, psychopathology and negative social, cognitive, emotional, and behavioural outcomes. The resulting similarities associated with the comparison between BPD and problem gambling indicates that many of the concepts from the model are also applicable to problem gambling. Therefore, it is reasonable to hypothesise that this model, or aspects of this model, may serve as a useful theoretical model for problem gambling. Further, the presence of personality disorder in problem gambling populations has indicated greater levels of difficulties across the model constructs indicating the likelihood of greater complexity in assessment, conceptualization, treatment planning and treatment implementation. As there is a high prevalence of personality disorders among both treatment seeking and community recruited problem gamblers, it would seem sensible for problem gambling treatment programs to incorporate routine screening for co-morbid personality disorders. Therefore, it would seem that the presence of a personality disorder has multiple clinical implications for the successful treatment of problem gamblers with co-morbid personality disorders. The highlighting of a number of similarities between BPD and problem gambling has created the basis upon which to assert the application of the biosocial developmental model of BPD to problem gambling. The use of this model not only provides a theoretical understanding of problem gambling, but suggest that Dialectical Behaviour Therapy (DBT), a treatment built on the theoretical foundations of the biosocial developmental model of BPD may be useful in the treatment of problem gambling. Although CBT and MI are recommended as treatments of choice (Cowlishaw et al. 2012; Thomas et al. 2011), there is increasing evidence for DBT and other third wave interventions which incorporate aspects of eastern based approaches to mind and body with CBT. Further research is required to explore the efficacy of these interventions for the treatment of problem gambling. Directions for future research include further investigation of the applicability of the biosocial developmental model to problem gambling through empirical investigations of the association between problem gambling and the variables from the model, for example, emotion regulation, and parent–child interactions. Additionally, future research should also further evaluate the degree to which DBT is effective in the treatment of problem gamblers.

A number of conclusions can be drawn from this review. There are similarities between individuals presenting with problem gambling and personality disorders, and in particular BPD. High levels of personality disorder co-morbidity are clearly evident among both community and treatment seeking problem gamblers, with BPD being one of the more prevalent personality disorders. Moreover, problem gamblers with a comorbid personality disorder present with a more complicated clinical picture, including greater problem
gambling severity, higher treatment dropout rates and other associated problems such as anxiety, depression and impulsivity.

Given these conclusions, we used the biosocial developmental model of BPD to examine similarities between problem gambling and BPD. The two disorders were found to share similarities in psychological factors such as poorer parent–child interactions, emotion dysregulation, psychopathology and negative social, cognitive, emotional, and behavioural outcomes. The resulting similarities associated with the comparison between BPD and problem gambling indicates that many of the concepts from the model are also applicable to problem gambling. Therefore, it is reasonable to hypothesise that this model, or aspects of this model, may serve as a useful theoretical model for problem gambling.

Further, the presence of personality disorder in problem gambling populations has indicated greater levels of difficulties across the model constructs indicating the likelihood of greater complexity in assessment, conceptualization, treatment planning and treatment implementation. As there is a high prevalence of personality disorders among both treatment seeking and community recruited problem gamblers, it would seem sensible for problem gambling treatment programs to incorporate routine screening for co-morbid personality disorders. For example, given that treatment compliance is likely to be negatively affected by the presence of a personality disorder, Blaszczynski and Steel (1998) recommend that clinicians pay attention to factors affecting compliance, such as levels of motivation, limit setting, therapy structure and the therapeutic relationship, and alter individual treatment goals and outcome objectives accordingly. Therefore, it would seem that the presence of a personality disorder has multiple clinical implications for the successful treatment of problem gamblers with co-morbid personality disorders.

The highlighting of a number of similarities between BPD and problem gambling has created the basis upon which to assert the application of the biosocial developmental model of BPD to problem gambling. The use of this model not only provides a theoretical understanding of problem gambling, but suggest that dialectical behaviour therapy (DBT), a treatment built on the theoretical foundations of the biosocial developmental model of BPD may be useful in the treatment of problem gambling. There are four core skill sets that clients are taught and encouraged to develop: mindfulness, distress tolerance, emotion regulation and interpersonal effectiveness (Linehan 1993). A number of studies have shown DBT to be effective in treating aspects of BPD (Carter et al. 2010; Linehan et al. 2006; McMain et al. 2009). Christensen et al. (2013) provide a detailed review of the use of DBT for problem gamblers and report on their study in which a small sample of ‘treatment resistant’ problem gamblers were provided with 9 weeks of DBT resulting in significantly improved psychological distress, mindfulness and distress tolerance. This study provides promising evidence for the use of DBT as a treatment for problem gamblers and highlights the need for further research in this area.

Directions for future research include further investigation of the applicability of the biosocial developmental model to problem gambling through empirical investigations of the association between problem gambling and the variables from the model, for example, emotion regulation, and parent–child interactions. Additionally, future research should also further investigate the role of DBT in the treatment of problem gamblers as DBT is also based on the biosocial developmental model.
References


