The two-faceted nature of impulsivity in patients with borderline personality disorder and substance use disorder

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ABSTRACT

Background: Impulsivity, which has been the subject of extensive debate in psychiatric research, is a clinically important concept, especially with respect to Borderline Personality Disorder (BPD) and Substance Use Disorders (SUD). The current study aims to examine the presence of two aspects of impulsivity (self-reported impulsivity and delay discounting) in patients with BPD, SUD (alcohol use = AUD or drug use = DUD) and the combination of both disorders (BPD + SUD).

Methods: Patients were recruited from eight different mental health treatment service facilities. A total of 345 participants were assessed and divided into six groups: (1) healthy controls (non-BPD, non-SUD), (2) patients with BPD (non-SUD), (3) DUD (non-BPD), (4) AUD (non-BPD), (5) BPD + AUD and (6) BPD + DUD.

Results: The behavioural measure of impulsivity is more conservative than the results of self-reported impulsivity. Furthermore, ANOVA indicated that BPD and SUD have significant effects on self-reported impulsivity, even when demographic variables, income, other psychiatric symptoms or depression are considered as covariates. On the other hand, the main effects of BPD and SUD are mediated by psychiatric symptoms and depression when delay discounting is considered as a dependent variable.

Conclusions: When self-reported, impulsivity is over-estimated as compared to reports based on behavioural measures. These results provide support for the notion that impulsivity is not a unitary construct, and that it instead has different manifestations in BPD and SUD patients.

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1. Introduction

Impulsivity is a core feature of both Borderline Personality Disorder (BPD) and Substance Use Disorders (SUD), and studies have indicated that individuals with both disorders (BPD + SUD) have even higher levels of impulsivity than those with either disorder alone (Links et al., 1995; Trull et al., 2004). It remains unclear, however, which factor (BPD or SUD) promotes higher impulsivity and which aspect of impulsivity (self-reported or behavioural) is affected by such conditions.

BPD and SUD are highly comorbid. Based on a systematic review, about 38–57% of BPD patients were also diagnosed with some sort of SUD (Trull et al., 2000). On the other hand, it is estimated that between 5 and 32% of substance-abusing individuals meet the criteria for BPD (Brooner et al., 1997; Weiss et al., 1993). These high comorbidity rates present considerable challenges for those providing mental health and addiction treatment services, given the higher levels of psychosocial impairment, the more severe psychopathology and substance use and the increased

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rates of self-harm and suicidal behaviour among these populations (Bowden-Jones et al., 2004; Darke et al., 2005; McMain and Ellery, 2008). Thus, we aimed to determine possible reasons for the comorbidity. Besides being a core feature of both BPD and SUD, it is believed that impulsivity may be a common factor behind the high rate of co-occurrence (Bornoválova et al., 2005).

However, our understanding of the role of impulsivity in these disorders and their comorbid presentation is limited due to the lack of attention to the complex, multidimensional nature of the construct of impulsivity (Bornoválova et al., 2005; Evenden, 1999). In general, impulsivity refers to the tendency or predisposition toward rapid, unplanned reactions to internal or external stimuli without appropriately considering the negative consequences for the impulsive individual or for others (Moeller et al., 2001). Impulsivity is generally considered to be a multifaceted phenomenon that can be evaluated with either self-report questionnaires or behavioural measures (Bornoválova et al., 2005; Evenden, 1999; Moeller et al., 2001). For instance, one manifestation of impulsivity on the behavioural or neurocognitive level is the preference for smaller immediate rewards over larger delayed rewards. This phenomenon is referred to as delay discounting (DD) (Madden and Bickel, 2010; Mazur and Commons, 1987).

Several studies have demonstrated that BPD is associated with elevated levels of self-reported impulsivity (Fossati et al., 2004; van Reekum et al., 1996) and the same is true for substance use disorders (de Wit, 2009; Dick et al., 2010). Given that DD is a facet of impulsivity and reflects a prototype pattern present in the clinical phenomenology of addictive behaviours, individuals with BPD and SUD are expected to display higher levels of DD. However, the results are controversial. Out of the five studies (Dougherty et al., 1999; Dom et al., 2006; Miller et al., 2009; Volker et al., 2009; Lawrence et al., 2010), only two (Volker et al., 2009; Lawrence et al., 2010) have found differences between BPD and non-BPD subjects in terms of delay discounting, the other three did not (Maráz and Demetrovic, 2011). On the other hand, based on a meta-analysis of 64 comparisons, a significant but small magnitude effect was found for DD among individuals with SUD vs. those without SUD (MacKillop et al., 2011).

Although many studies highlight the importance of impulsivity in BPD and SUD, very little is known about impulsivity in patients with both diagnoses despite the high comorbidity. The available studies suggest that BPD + SUD comorbidity is associated with higher levels of self-reported impulsivity than in either condition alone (Krueelbach et al., 1993). Regarding behavioural impulsivity, however, only one study has investigated DD in BPD + SUD patients. Coffey et al. (2011) have found that BPD + SUD individuals preferred smaller immediate gratification to larger delayed rewards more often as compared to those with BPD and a healthy control group, although the difference was small.

Despite the large amount of research, the relation between self-reported and behavioural or neurocognitive measures of impulsivity is not fully clear (Bickel and Marsch, 2001; Reynolds, 2006). For example, in a translational study comparing self-reported impulsivity with DD using both rodents and humans in tests involving impulsive choice and impulsive action, there were no substantial correlations between these different aspects of impulsivity (Broos et al., 2012). Barker et al. (2015) found that, contrary to their expectations, individuals with BPD showed elevated motor impulsivity but not self-reported impulsivity as compared to healthy controls. Furthermore, there are indications that these different measures of impulsivity have a different neural basis (Broos et al., 2012).

The aim of this study was to examine the presence of two separate aspects of impulsivity (self-reported impulsivity and DD) in patients with BPD, SUD, and the combination of both disorders (BPD + SUD) in comparison with a healthy group, controlling for possible covariates (age, gender, education, socio-economic status, psychiatric symptoms and depression).

2. Material and methods

2.1. Participants

Patients were recruited from eight different Hungarian treatment service facilities. All patients with SUD (with or without BPD) were recruited from one of the three Addiction Treatment Services centres in Hungary, where they all received treatment for substance abuse or dependence as their primary diagnosis. BPD (but not SUD) patients were recruited from five Mental Health Services centres where substance dependence is an exclusion criterion for admission. If the patient received a diagnosis of BPD and/or SUD from the consultant psychiatrist in charge according to the ICD-10 criteria during screening at admission, the patient was invited to take part in the study. During the study period (October 2010 until May 2011) all patients with at least one of the above diagnoses were approached to participate.

In addition, a group of healthy control subjects was recruited by convenience sampling and consisted of acquaintances of university undergraduate students. To ensure similar educational level and socio-educational status (SES), about 60% of the sample was collected from vocational evening schools for adults. Exclusion criteria for the healthy control group (HC) were any psychiatric diagnoses in their past and the consumption of any illicit substances or medication abuse more than twice in the last 12 months, as well as having a score $\geq 8$ on the Alcohol Use Disorders Identification Test (AUDIT). Ninety-three percent had a score of 5 or less on the AUDIT, and the average AUDIT score for the control group was 2.4 (SD: 1.9).

A total of 393 persons were assessed (N = 258 patients and N = 135 healthy control subjects). Of the 258 patients, 18 were excluded because the outcomes of the screening and the formal diagnosis did not match, one patient was unable to complete the assessment and five patients had to be excluded because of technical issues (output files not saved), leaving 234 patients for analysis.

Of the 135 control subjects, 14 turned out to be substance users, eight had been under psychiatric treatment or were diagnosed as having BPD and two had to be excluded because of technical issues (output files were not saved), leaving 111 healthy controls for analysis.

The study sample thus consisted of 345 participants (N = 234 patients and N = 111 healthy controls) with diagnostic agreement between the screening assessment (SCID-II BPD module and AUDIT) and the clinical psychiatric assessment. Of the 234 patients, 101 did not have BPD and primarily abused alcohol and/or medication (AUD), whereas 23 did not have BPD and primarily abused drugs such as heroin, cocaine and/or amphetamines (DUD). Thirty-six patients had a diagnosis of BPD without SUD (BPD) and 49 patients had BPD and abused alcohol and/or medication (BPD + AUD). Finally, 25 patients had BPD and abused other drugs (BPD + DUD).

After written informed consent was obtained, tests and semi-structured interviews were administered to the participants during face-to-face interviews. Participants were told that the computer-based task would measure their decision-making tendencies. None of the participants had consumed any alcohol or drugs 24 h prior to administration of the study. The study protocol was approved by the Institutional Review Board of Eötvös Loránd University.

2.2. Measures

2.2.1. Borderline symptoms. The BPD module of the Structured Clinical Interview for DSM-IV Disorders (SCID-II) (First et al., 1995) was
administered to all participants to assess the presence of BPD symptoms. The SCID-II covers the criteria of the DSM-IV for BPD and therefore can be used as a diagnostic instrument for both clinical and non-clinical samples (Piedmont et al., 2003). This instrument was translated and back-translated to Hungarian, and differences were discussed in cases of non-agreement.

2.2.2. Alcohol and substance use. We administered the Alcohol Use Disorders Identification Test (AUDIT) which is a 10-item self-report screening test in which all items are rated from 0 to 4 (Saunders et al., 1995). A score of 8 or more points indicates problematic drinking and the possible presence of an alcohol use disorder. In addition to the use of AUDIT, both current alcohol and/or other current substance use disorders were screened by point-of-entry psychiatric interviews. The instruments were translated into Hungarian, with the translation being checked through blind back translation (Gerevich et al., 2005).

2.2.3. Symptom severity. The aim of the Brief Symptom Inventory (BSI) (Derogatis and Melisaratos, 1983) is to identify self-reported clinically relevant Axis I psychiatric symptoms in adolescents and adults. The BSI consists of 53 items covering nine symptom dimensions: Somatisation, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism. The Global Severity Index (GSI) is calculated from the grand total score (Cronbach’s alpha in the current sample: 0.97). Apart from the GSI, only the Depression subscale of the BSI was used in the analyses to control for the possible mediating effects, given that depression has been closely linked to BPD (Gunderson and Phillips, 1991). The BSI has recently been validated for use in the Hungarian population (Urbán et al., 2014) (Cronbach’s alpha: 0.90).

2.2.4. Trait impulsivity. The Hungarian version of the 30-item Barratt Impulsiveness Scale, version 11 (BIS) (Patton and Stanford, 1995) was used to measure general impulsiveness. The instrument contains three second-order subscales (Attentional Impulsivity, Motor Impulsivity, and Non-planning Impulsivity). Items are rated from 1 (rarely/never) to 4 (almost always/always). The internal consistency of the BIS total score was good (Cronbach’s alpha in the current sample: 0.86) and the same was true for the subscales (Attentional Impulsivity: 0.76, Motor Impulsivity: 0.74, Non-planning Impulsivity: 0.68). The Hungarian version was reported in Varga et al. (2015).

2.2.5. Delay discounting. Mitchell’s computerised DD task was presented to all participants on a notebook computer (Mitchell, 1999). Each question was comprised of a choice between two amounts of money. One displayed an immediate reward which varied between 0HUF and 55,000HUF in 2,500HUF increments (alternative item) (1 EUR is about 300HUF) which was always available immediately. The other option was a standard 50,000HUF offered with a delay (0, 1, 14, 60, 180 or 365 days). Therefore the task consisted of 138 hypothetical questions presented in random order (i.e., Which one would you choose? 20,000HUF now or 50,000HUF a week later?). Participants indicated their preferences by a single click on their choice, then by clicking on the ‘Next question’ button, after which the next question appeared. The aim of the DD task is to determine the point at which the immediate reward (alternative item) is preferred over the delayed reward (standard item). This is known as the ‘indifference point’, which can be calculated for each period of delay. Above the indifference point (expressed in HUF), the participant chooses the immediately available option, whereas below the indifference point, the participant chooses the option available with a delay.

2.3. Data analysis

To assess the rate of discounting, a hyperbolic equation was fitted for each participant’s indifference point (Mazur and Commons, 1987; Mitchell, 1999) using the Solver subroutine in Microsoft Excel 2007:

\[ V = \frac{\text{Std}}{1 + kX} \]

where \( V \) represents the value of the standard item indexed by the indifference point, \( \text{Std} \) represents the amount of money available from the standard item (50,000HUF), \( k \) is a fitted parameter indexing the rate of discounting and \( X \) indicates the length of delay. The steepness of the curve (\( k \)) is fitted to the subjective value of each point of delay. The steeper the curve (thus the closer the \( k \) value is to zero), the more the individual prefers immediate rewards as opposed to delayed ones, and thus the more impulsive are the choices that are made.

ANOVA F-tests were used to compare means among groups for continuous variables, and chi-square tests were used to compare proportions among groups for discrete variables. In order to run ANOVA, the heterogeneity of variance was first tested. Levene’s test indicated that there was no significant heterogeneity of variance across groups with \( k \) as a dependent variable: \( F = 1.34 \) (\( p = 0.25 \)). However, using BIS as a dependent variable, Levene’s test indicated significant heterogeneity: \( F = 3.86 \) (\( p = 0.002 \)). Thus, the robust alternative of ANOVA was used. Given that SPSS does not calculate a robust alternative for the 2-way ANOVA, we carried out these calculations in ROPStat (Varga et al., 2015). This statistical package calculates Welch’s \( t \)-test as a robust alternative to ANOVA (Wilcox, 1997, 2003). Thus, models with BIS as a dependent variable were calculated using Welch’s \( t \)-test. For post-hoc comparisons between groups, Tukey’s test was used. To assess the associations, a series of linear Pearson product-moment correlations were performed between the different measures of impulsivity. To explore the effect size in ANOVA, \( R^2 \) squared (variance explained) and eta squared was calculated.

All variables including indifference points between groups and over time were normally distributed according to the Q-Q plots, except for the \( k \) values. To meet the statistical assumptions, \( k \) values were transformed into normal logarithms. In 14 cases, \( k \) had a negative value which could not be log-transformed (3HC, 5 AUD, 1 DUD, 3 BPD, 2 BPD + AUD and 1 BPD + DUD). Negative \( k \) values mean that the participant prefers later rewards to the immediate ones regardless of the length of delay (so, for example, they choose 6,000HUF later over 18,000HUF now). This is likely to be reflective of invalidity and was therefore treated as missing data in the analyses. Outliers were distributed randomly across groups (\( \chi^2 = 0.307, p = 0.858 \)).

Effect sizes were calculated using Cohen’s \( d \) (Rosnow et al., 2000). Cohen’s \( d \) is defined as the difference between two means divided by the pooled standard deviation. According to Cohen (2013), an effect size of 0.2–0.3 is a “small” effect, around 0.5 a “medium” effect and above 0.8 a “large” effect.

3. Results

3.1. Sample characteristics

The six groups differed significantly in gender, age and years of education at a \( p < 0.05 \) level (see Table 1). Regarding socio-economic status (SES), the BPD + AUD group reported significantly lower status compared to all other groups. Furthermore, there were group differences in GSI and Depression scores, with the BPD + DUD group reporting the highest level of psychiatric symptoms and depression.
3.2. Impulsivity and group differences

Delay discounting was moderately correlated with the Barratt Impulsiveness Scale Total Score ($r = 0.32$, $p < 0.001$), the BIS Motor Impulsivity Score ($r = 0.29$, $p < 0.001$), the BIS Non-planning Score ($r = 0.28$, $p < 0.001$) and the BIS Attentional Impulsivity Score ($r = 0.25$, $p < 0.001$).

Table 2 illustrates that BPD groups had the highest scores of self-reported impulsivity regardless of their SUD status. In addition, their self-reported impulsivity was significantly higher than the corresponding rate in the HC group. With regard to DD, the BPD + DUD group was the most impulsive (as indicated by closer-to-zero discounting values). The AUD, DUD and other BPD groups were not significantly more impulsive than the HC group in terms of DD values. Fig. 1 shows that although dual diagnosis (BPD + SUD) is associated with higher DD and self-reported impulsivity, differences in self-reported impulsivity are greater than in DD.

3.3. Group interactions and impulsivity

We conducted a series of ANOVAs with the different facets of impulsivity (BIS Total Score and DD) as dependent variables, and BPD (BPD and non-BPD) and SUD (non-SUD, AUD and DUD) as independent variables. Five models were explored: without adjustment for potential covariates (Model 1), with adjustment for age, gender and education (Model 2), with adjustment for age, gender, education and SES (Model 3), with adjustment for age, gender, education and GSI (Model 4), and with adjustment for age, gender, education and depression (Model 5).

Entering the BIS Total Score as the dependent variable, significant main effects for BPD and SUD in each of the five models were obtained ($F_{BPD,M1} = 95.19$, $p < 0.001$ and $F_{SUD,M1} = 7.29$, $p < 0.001$; $F_{BPD,M2} = 74.32$, $p < 0.001$ and $F_{SUD,M2} = 6.53$, $p < 0.001$; $F_{BPD,M3} = 65.12$, $p < 0.001$ and $F_{SUD,M3} = 7.61$, $p < 0.001$; $F_{BPD,M4} = 10.02$, $p < 0.001$ and $F_{SUD,M4} = 2.8$, $p = 0.048$; $F_{BPD,M5} = 26.48$, $p < 0.001$ and $F_{SUD,M5} = 4.75$, $p < 0.01$). Group interactions (BPD × SUD) were non-significant ($F_M5 = 1.56$, $p = 0.21$; $F_M2 = 0.87$, $p = 0.512$; $F_M3 = 0.41$, $p = 0.666$; $F_M4 = 0.68$, $p = 0.728$; $F_M5 = 0.52$, $p = 0.648$).

With delay discounting as the dependent variable, BPD had a main effect in the first three models ($F_{BPD,M1} = 13.44$, $p < 0.001$; $F_{BPD,M2} = 12.47$, $p < 0.001$; $F_{BPD,M3} = 9.01$, $p < 0.01$) but not in the other two ($F_{BPD,M4} = 1.55$, $p = 0.214$; $F_{BPD,M5} = 1.51$, $p = 0.220$). SUD did not have any significant main effect on delay discounting ($F_{SUD,M1} = 2.51$, $p = 0.083$; $F_{SUD,M2} = 2.02$, $p = 0.135$; $F_{SUD,M3} = 2.10$, $p = 0.124$; $F_{SUD,M4} = 1.21$, $p = 0.300$; $F_{SUD,M5} = 1.30$, $p = 0.274$). There were also no significant BPD × SUD interaction effects ($F_M1 = 0.14$, $p = 0.869$; $F_M2 = 0.01$, $p = 0.990$; $F_M3 = 0.05$, $p = 0.955$; $F_M4 = 0.19$, $p = 0.829$; $F_M5 = 0.43$, $p = 0.651$).

With regard to explaining variance, Model 5 had superior fit with DD as a dependent variable ($R^{2}_M1 = 0.07$, $R^{2}_M2 = 0.11$, $R^{2}_M3 = 0.13$, $R^{2}_M4 = 0.13$, $R^{2}_M5 = 0.14$), whereas Model 4 was superior with the Barratt Impulsiveness Total Score as a dependent variable ($R^{2}_M1 = 0.34$, $R^{2}_M2 = 0.37$, $R^{2}_M3 = 0.39$, $R^{2}_M4 = 0.48$, $R^{2}_M5 = 0.44$).

4. Discussion

The present study shows that the behavioural measure of impulsivity is more conservative than self-reported impulsivity among patients with BPD and/or SUD (AUD and/or DUD). Although variables such as psychiatric symptoms, depression and demographic variables (to a lesser extent) explain a large proportion of cases of self-reported impulsivity, these do not change the effect of the diagnosis (BPD and/or SUD). These results show that impulsivity is not a unitary construct and it has different manifestations in BPD and substance use disorder.
and SUD. Furthermore, the results suggest that self-reported impulsivity is over-estimated as compared to behavioural impulsivity, which is a significant finding that should be taken into account when interpreting the results of survey studies.

These results are in line with previous findings suggesting that BPD has a main effect on DD values independently of SUD (Berenson et al., 2016). The dissociable effects between self-reported and behavioural impulsivity strongly suggest different underlying neural correlates of impulsive choice and impulsive action, similar to previous between-subjects studies showing the opposing effects of SUD on impulsive action and impulsive choice (Broos et al., 2012; Wiskerke et al., 2011). Therefore, these findings are in line with earlier results showing dissociable roles of, for example, dopamine, glutamater and serotonin in modulating impulsive choice and impulsive action (Chamberlain and Sahakian, 2007; Winstanley et al., 2006). The question whether self-reported or behavioral impulsivity is a more accurate way to measure impulsivity should be tested in the future using external indicators such as predictive validity.

When self-reported, DUD (without BPD), BPD (without SUD), BPD + AUD and BPD + DUD patients have higher impulsivity than those in HC, which is in line with previous findings (Kruegelbach et al., 1993). The notion that the AUD and HC groups do not differ substantially in terms of impulsivity might be explained by the time of onset; future studies should separate late-onset alcoholics (LOA) from early-onset alcoholics (EOA), as there is evidence that EOA have higher levels of impulsivity than LOA (Dom et al., 2006).

On the other hand, on the behavioural level, only BPD + DUD is associated with elevated impulsivity compared to HC, and other group differences are either non-significant or have a small effect size. This is likely to reflect either the fact that self-reported and behavioural facets cover different aspects of impulsivity or that personality traits that are associated with personality disorder (Costa and McCrae, 1990) are also associated with more extreme response styles (Hamilton, 1968). Finally, this result may indicate that an implicit vulnerability is present in drug abuse before it is manifested on the level of self-reporting (Dick et al., 2010).

Furthermore, while self-reported impulsivity is not mediated by demographical and psychiatric symptoms in BPD or in SUD, behavioural impulsivity is mediated by psychiatric symptoms and depression. The latter might explain the mixed findings in delay discounting and BPD research (Maráz and Demetrovics, 2011).
and delay discounting and SUD literature (MacKillop et al., 2011),
given that the level of impairment is likely to have differed across samples. Future studies assessing behavioural or neurocognitive impulsivity should control for other psychiatric symptoms and depression. Additionally, future studies should also test whether severe psychiatric symptoms lead to impulsivity or vice versa.

The results presented here should be viewed in light of some methodological limitations. The main limitation of this study is the reliance on self-reported data, including substance use 24 h prior to data collection, which might be biased. Another limitation of the study is the presence of unbalanced sample sizes across groups, which may have led to Type II errors. Moreover, groups were unmatched with respect to demographical variables, as we had decided to minimise data collection bias and apply systematic sampling instead of matching groups across the study. Comorbid disorders were also ignored, although there exists an association between impulsivity and, for example, antisocial personality disorder (Petry, 2002). Another issue concerns the hypothetical nature of delay discounting and its external validity (Bickel and Marsch, 2001), although research comparing real and hypothetical choices revealed no significant difference in the degree of delay discounting (Lagorio and Madden, 2005; Madden et al., 2004). Implementing an alcohol and drug free period of only 24 h prior to testing may have allowed participants who were experiencing withdrawal effects or hangovers to be included in the study, and therefore elevated impulsivity may have been partly caused by intoxication or withdrawal. Finally, future studies should consider other aspects of impulsivity, such as risk-taking or response inhibition (Bornovalova et al., 2005) and compare these types to self-reported and behavioural impulsivity.

5. Conclusions

In summary, we found that BPD and SUD have additive effects on both self-reported impulsivity and delay discounting, although the differences in self-reported impulsivity are more robust than those on the behavioural level. This means that behavioural impulsivity is more conservative than self-reported impulsivity, or in other words, participants with BPD and/or SUD tend to over-estimate their behavioural impulsivity. Future studies should take into consideration the role of comorbid BPD for SUD and SUD for BPD when assessing impulsivity in dual diagnosis patients as well as the effect of other psychiatric symptoms. In addition, the current study shows that behavioural and pharmacological treatment strategies may benefit from taking into account the divergent nature of impulsivity.

Conflicts of interest

None.

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References


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