

Elsevier Editorial System(tm) for Psychiatry Research
Manuscript Draft

Manuscript Number:

Title: Prevalence and construct validity of compulsive buying disorder in shopping mall visitors

Article Type: Research Article

Section/Category: Symptoms

Keywords: compulsive shopping; shopping addiction; prevalence; consumer behaviour; behavioural addiction

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Abstract: Compulsive buying is a relatively new psychopathological concept and very few data are currently available regarding the prevalence and validity of compulsive buying disorder. In this cross-sectional study, we establish the prevalence of compulsive buying disorder in shopping mall visitors and explore the construct validity of the concept using the revised version of the Edwards Compulsive Buying Scale in 1,441 shopping mall visitors looking at shopping habits, current substance use (smoking, alcohol and illicit drug) and various psychological characteristics. Overall, 8.7% (95% CI: 7.3-10.3) of our sample was classified as having a compulsive buying disorder. Compulsive buyers were younger, less educated and more likely to be female than non-compulsive buyers. They were also more likely to have used licit and illicit substances. Compulsive buyers also reported higher levels of impulsivity and obsessive-compulsive symptoms, lower levels of well-being and self-esteem and more psychological distress. Finally, compulsive buyers were five times more likely to meet criteria for borderline personality disorder than non-compulsive buyers. Compulsive buying is a frequent disorder in shopping mall visitors and is associated with important and robust indicators of psychopathology thus supporting the validity of the construct.

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Professor Monte S. Buchsbaum
Editor-in-chief
Psychiatry Research

Subject: *submission of manuscript*

July 21st, 2014

Dear Professor Buchsbaum,

We would like the attached manuscript titled '*Prevalence and construct validity of compulsive buying disorder in shopping mall visitors*' to be considered for publication in *Psychiatry Research*. Although there is considerable research regarding in the field of compulsive buying behavior, the prevalence of the validity of the disorder are relatively unknown. In this cross-sectional study, 8.7% of our sample ($n=1441$) had compulsive buying disorder and we found that compulsive buying is associated with important and robust indicators of psychopathology thus supporting the validity of the construct.

The authors (*Aniko Maraz, Wim van den Brink, Zsolt Demetrovics*) declare that they do not have any interests that could constitute a real, potential or apparent conflict of interest with respect to his/her involvement in the publication. The authors also declare that they do not have any financial or other relations (e.g. directorship, consultancy or speaker fee) with companies, trade associations, unions or groups (including civic associations and public interest groups) that may gain or lose financially from the results or conclusions in the study.

The study was exclusively carried out by the investigators. The authors of this manuscript had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

This paper has not been, nor will be, published in whole or in part by any other journal and is under consideration for publication elsewhere. The submission to your journal has been approved by all of the authors as well as the indicated authorship order.

We hope you will find this manuscript of significant interest to merit publication in *Psychiatry Research*.

Sincerely yours,

Aniko Maraz
Corresponding author

Prevalence and construct validity of compulsive buying disorder in shopping mall visitors

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Word count: 3998

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Prevalence and construct validity of compulsive buying disorder in shopping mall visitors

HIGHLIGHTS

1. Compulsive buying is a relatively new psychopathological concept and very few data are currently available regarding the prevalence and validity of compulsive buying disorder.
2. 8.7% of shopping mall visitors (out of $n=1441$) were classified as having a compulsive buying disorder
3. Compulsive buyers are younger, less educated and more likely to be female than non-compulsive buyers. They are also more likely to have used licit and illicit substances.
4. Compulsive buyers also report higher levels of impulsivity and obsessive-compulsive symptoms, lower levels of well-being and self-esteem and more psychological distress
5. Compulsive buyers are five times more likely to meet criteria for borderline personality disorder than non-compulsive buyers
6. Compulsive buying is a frequent disorder in shopping mall visitors and is associated with important and robust indicators of psychopathology which supports the validity of the construct

Prevalence and construct validity of compulsive buying disorder in shopping mall visitors

ABSTRACT

Compulsive buying is a relatively new psychopathological concept and very few data are currently available regarding the prevalence and validity of compulsive buying disorder. In this cross-sectional study, we establish the prevalence of compulsive buying disorder in shopping mall visitors and explore the construct validity of the concept using the revised version of the Edwards Compulsive Buying Scale in 1,441 shopping mall visitors looking at shopping habits, current substance use (smoking, alcohol and illicit drug) and various psychological characteristics. Overall, 8.7% (95% CI: 7.3-10.3) of our sample was classified as having a compulsive buying disorder. Compulsive buyers were younger, less educated and more likely to be female than non-compulsive buyers. They were also more likely to have used licit and illicit substances. Compulsive buyers also reported higher levels of impulsivity and obsessive-compulsive symptoms, lower levels of well-being and self-esteem and more psychological distress. Finally, compulsive buyers were five times more likely to meet criteria for borderline personality disorder than non-compulsive buyers. Compulsive buying is a frequent disorder in shopping mall visitors and is associated with important and robust indicators of psychopathology thus supporting the validity of the construct.

Key words: compulsive shopping, shopping addiction, prevalence, consumer behaviour, behavioural addiction

1. INTRODUCTION

Compulsive buying disorder (CBD) is a complex, and highly debated concept. According to some, it refers to a specific kind of maladaptive behaviour that interferes with everyday functioning and may result in serious financial problems (McElroy et al., 1994). However, others question the existence of CBD as psychopathological concept, claiming that CBD is only a medicalization of people's general tendency to overspend (Lee and Mysyk, 2004). The question therefore remains whether CBD is a valid diagnostic entity.

The lifetime prevalence rates of CBD vary largely from one study to another (for a review see: Maraz and Demetrovics, submitted). In nationally representative samples, the occurrence of CBD was estimated to be between 1% (in the Eastern part of Germany) and 8% (in the Western part of Germany) (Neuner et al., 2005). However, given that compulsive buyers are especially prone to advertising (Mikołajczak-Degrauwe and Brengman, 2014) and over-reactive to shopping-related cues (Starcke et al., 2013) it is reasonable to suppose that the prevalence of CBD is higher in shopping mall visitors than in the general population. In line with these expectations, Phau and Woo (2008) found that over one-third (37%) of Australian shopping mall visitors were classified as CBD based on the Compulsive Buying Scale (CBS, Faber and O'Guinn, 1992). Another study (Lejoyeux et al., 2007) found similarly high rates of CBD (33%) in 200 women entering a prestigious Parisian department store (selling mostly luxurious items) when using both McElroy et al.'s criteria of compulsive buying and a score ≥ 10 on the Questionnaire of Buying Behavior (QABB, Lejoyeux et al., 1997). However, using the same instrument, the QABB, we found that "only" 2.5% of 1,447 shopping mall visitors in Hungary could be characterised as compulsive buyers.

Whether these extreme differences reflect actual differences in the prevalence of CBD (i.e. cultural or sample differences) or are due to differences in methodologies (data collection technique, sampling bias, cut-off values etc.) is unclear. However, a large proportion of the variability in the prevalence is probably due to the different conceptualisations of the disorder. For example, some authors focus on the components of impulsivity and obsessive-compulsive symptoms ignoring income (Ridgway et al., 2008) while others approach CBD from its consequences such as credit card overuse (Faber, 2000; Faber and O'Guinn, 1992). Furthermore, very few of the instruments used on normal populations, and none of the questionnaires used in shopping mall samples explicitly assessed the current prevalence of CBD. Questions included current as well as lifetime occurrence of CBD, but none of the

studies used an explicit and restricted time frame for the answers. This is problematic, because prevalence rates with different time frames (lifetime versus current) are hardly comparable.

Given the mixed theoretical approaches and varying prevalence rates, the question arises “what constitutes CBD”. CBD is listed as “shopping addiction” in the appendix of the most recent version of The Diagnostic and Statistical manual of Mental Disorders (DSM-5, APA), but it is not recognised as a distinct mental disorder due to insufficient evidence to establish the diagnostic criteria (American Psychiatric Association, 2013). Nonetheless, CBD is considered by many to constitute a behavioural addiction (Demetrovics and Griffiths, 2012; Lo and Harvey, 2012; Rose and Dhandayudham, 2014; Starcke et al., 2013). Like most addictive disorders, compulsive buying is characterised by both impulsive and compulsive aspects (Christenson et al., 1994; McElroy et al., 1994). As an impulse-control disorder, CBD is marked by irresistible impulses to perform harmful behaviours that are beyond the individual’s control (i.e., debts that create problems at home or in work life). CBD also has obsessive-compulsive aspects based on harm-avoidance behaviour, which is mostly triggered by internal stimuli such as mounting tension (Faber and O’Guinn, 2008; Hollander and Allen, 2006; McElroy et al., 1994; Ridgway et al., 2008; Rook and Fisher, 1995). However, in a study by Phau and Woo (2008), no differences between compulsive and non-compulsive buyers were found in terms of distrust and general anxiety which are otherwise known to be strong indicators of obsession-compulsion (Foa et al., 1998).

The status of CBD is supported by the fact that it seems to co-occur with a variety of other mental health disorders and addictive behaviours. For instance, Black et al. (1998) found that compulsive buyers are three times more likely to develop an eating disorder and over two times more likely to abuse substances compared to non-compulsive buyers. Furthermore, compulsive buyers frequently meet the criteria for mood disorders (21-100%), anxiety disorders (41-80%), substance use disorders (21-46%) and eating disorders (8-35%) (Black, 2007). Finally, Schollosser et al. (1994) have found that out of 46 compulsive buyers, 27 (59%) met the diagnosis for at least one personality disorder, of which the occurrence of borderline personality disorder was 15%.

Despite theoretical criticism, empirical evidence generally supports the maladaptive consequences of CBD. Based on a study of 20 compulsive buyers, for example, Christenson et al. (1994) found that excessive shopping induces large debts (58%), guilt (46%), inability to meet payments (42%), criticism from acquaintances (33%), and that it may lead to criminal and legal problems (8%). Although compulsive buyers do not have more credit cards than

non-compulsive buyers, they are more likely to have a negative credit balance and therefore accumulate debts (Koran et al., 2006). Thus, CBD is not only harmful for the individual, but it also adversely affects compulsive buyers' environment, such as their families.

At the same time, very few studies have assessed how *current* compulsive buying behaviour reflects *current* shopping habits and how *current* compulsive shopping behaviours are associated with *current* psychological characteristics. Furthermore, to our knowledge, none of the available studies explored *current* buying behaviour in shopping malls.

Therefore, the purpose of the current study was to establish the current prevalence of CBD and to establish the construct validity of the concept of current CBD in a sample of shopping mall visitors. We expect that (1) current prevalence of CBD will be lower than in some of the previous studies without a clear time frame. We also hypothesize that (2) compulsive buyers are likely to be younger, have lower education and lower income, and are more likely to be female and single than non-compulsive buyers. If compulsive buying disorder is a psychologically valid construct, we also expect that compulsive buyers report (3) greater general dissatisfaction with life, as well as lower self-esteem. If CBD is an addiction problem, we expect that (4) compulsive buyers have elevated sensation seeking, impulsivity and obsessive-compulsive symptoms and that they have experimented with legal (smoking and alcohol drinking) and illicit substances more than non-compulsive buyers. Regarding the consequences, we hypothesize that (5) compulsive buying is associated with elevated credit card use, strolling and an increased frequency of shopping. Finally, we expect that (6) current CBD is associated with the presence of more borderline personality disorder traits.

2. METHODS

This study was carried out as part of a larger study designed to assess the prevalence and characteristics of compulsive buying in shopping malls. A brief overview of data collection is presented here, and a more detailed description has been provided elsewhere (Maraz et al., submitted).

2. 1. Participants and procedure

The study aimed to capture participants at three different shopping malls in Budapest and one in Győr (Western-Hungary) between April and November 2012. University students stopped customers who were (i) 18 years and older, (ii) had a valid e-mail address, and (iii) spoke Hungarian. After introducing the goals of the study, all subjects were asked to sign the informed consent and to provide their e-mail address.

Overall, 37,469 people passed the entrance at time of data collection. Out of these, 28,629 persons met our inclusion criteria and were approached. Just over twenty-thousand persons (20,191) stopped and received information about the study. One-fifth of these, i.e. 5,068 people (17.7%), agreed to participate and were sent the link of the questionnaire by e-mail. Following two reminders when necessary, we received 1,441 valid answers (28.4%) to the ECBS-R questionnaire which compromised our study sample. Participants did not receive any compensation. However, they all received some brief feedback regarding their self-reported buying behaviour. The study design was approved by the Institutional Review Board of the university.

2. 2. Measures

2. 2. 1. Compulsive buying disorder

A revised version of the Edwards Compulsive Buying Scale (ECBS-R, Edwards, 1993; Maraz et al., submitted) was used to assess current CBD (see Appendix). The ECBS-R is based on the scale of Faber and O'Guinn (1922), contains 16 items, rated 1 (I do not agree) to 5 (I completely agree) and encompasses four subscales: Lack of control, Mood modification, Guilt, and Unnecessary buying. The ECBS-R has a validated cut-off value to identify compulsive buyers; individuals who scored 42 or more on the ECBS-R were regarded to be compulsive buyers (Maraz et al., submitted).

2. 2. 2. Demographics and shopping habits

Major socio-demographic characteristics of buyers and the shopping habits (including goods they bought) were asked using an ad hoc questionnaire specially designed for the current study taking into account local circumstances.

2. 2. 3. General wellbeing, distress and self-esteem

Well-being. The short form of the WHO Well-Being Scale contains 5 items that reliably assess individuals' well-being over the past 30 days (WBS-5, Heun et al., 1999). Items are

rated 0 to 3, and higher scores indicate greater subjective well-being. Cronbach's alpha in the current study was 0.81.

Psychological distress experienced in the past week was assessed by the Brief Symptom Inventory (BSI, Rose, 2007; Sansone and Wiederman, 2012), which is the short version of the Symptom Checklist 90 - Revised (SCL-90-R) (Claes et al., 2010). BSI has recently been validated in Hungarian population (Urbán, 2014). The BSI is a 53-item self-report symptom inventory where each item of the questionnaire is rated on a five-point scale of distress from 0 (not at all) to 4 (very much). The Global Severity Index (GSI) is calculated using the sums for the nine symptom dimensions plus the four additional items not included in any of the dimension scores. In the current study the GSI had excellent reliability (Cronbach's alpha: 0.96).

Self-esteem was assessed using the Hungarian version of the Rosenberg Self-Esteem Scale (RSES, Rosenberg, 1965). This scale contains five positively and five negatively worded items and is answered on a four-point scale where higher scores indicate higher self-esteem. The validity of this widely used tool has recently been confirmed in the Hungarian population (Urbán et al., 2013). Cronbach's alpha on the current sample was 0.86.

Contingent self-esteem (CSE) refers to the external sources of a person's perceived self-worth such as others' love and evaluation of competence (Johnson and Blom, 2007). The 26 items are rated 1 to 4, with higher scores indicating higher proneness to base one's self-esteem on others' evaluation. CSE contains two sub-scales: Competence-based and Relation-based self-esteem. Cronbach's alpha for subscales in the current study were 0.89 and 0.90, respectively.

2. 2. 4. *Addiction-related psychological constructs and substance use*

Participants were asked about their smoking habits, as well as whether or not they had used the listed substances during the past 12 months. Alcohol consumption was measured by the first three questions of the Alcohol Use Disorders Identification Test Consumption (AUDIT-C, Bush et al., 1998), that refer to frequency, quantity and excessiveness of alcohol consumption over the past 12 months.

Sensation Seeking was assessed by the Brief Sensation Seeking Scale (BSSS, Hoyle et al., 2002). The eight questions were derived from the SSS-V (Zuckerman et al., 1978) in a way that each of the four subscales (Experience seeking, Boredom susceptibility, Thrill and adventure seeking, and Disinhibition) is represented by two items from the original version. In the current study, the scale had good reliability (0.80).

Impulsivity was measured by the Hungarian version of the Barratt Impulsiveness Scale (BIS, Sansone et al., 2011; Varga et al., 2014). This version contains 21 items, which are rated 1 to 4. The scores load on three factors: Self-control, Impulsive behaviour, and Impatience. Cronbach's alphas were 0.74, 0.77 and 0.67, respectively. The total score in the current study had good reliability (0.82).

Obsessive-compulsive symptoms were measured by the Obsession-Compulsion subscale of the Brief Symptom Inventory (see above) (Rose, 2007; Sansone and Wiederman, 2012). The scale had good reliability in the current sample (0.78).

2. 2. 5. *Borderline personality disorder (BPD)*

Borderline symptoms were assessed using the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD, Zanarini et al., 2003). The instrument is based on the DSM-IV criteria of borderline personality disorder and is suitable to be used as a severity index for borderline symptoms. The ten items are rated yes-or-no, and ≥ 7 affirmative answers indicate the probable presence of borderline personality disorder. The MSI-BPD has acceptable sensitivity (81%) and specificity (85%) when the BPD module of the Diagnostic Interview for DSM-IV Personality Disorders (Zanarini et al., 1996) was applied as external criterion. The scale also had good reliability (0.75) in the current sample.

2. 3. Data Analysis

Current prevalence of CBD was estimated by dividing the number of CBD subjects by the total sample and the 95% confidence interval (95% CI) around this estimate. To study the construct validity of CBD, subjects with and without CBD were compared on a series of continuous and dichotomous variables, using independent sample t-tests and Chi-square significance tests respectively. Effect sizes were calculated using the Odds Ratio's (ORs) and their 95% CI for categorical variables, and Cohen's *d* for continuous variables (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 to 0.3 is a "small" effect, around 0.5 is a "medium" effect and above 0.8 is a "large" effect. Cases were dropped list-wise where data were missing (i.e. socio-economic status).

To avoid false positive findings due to multiple testing, we adjusted the level of significance according to the number of tests that were carried out. Given that there were 26 comparisons overall, we have defined the threshold for significance at $0.05/26=0.002$.

3. RESULTS

3. 1. Sample characteristics

Almost two-thirds (63%) of the participants ($n=906$ out of 1,441) were female. Mean age was 31.2 years ($SD = 12.1$, min: 18, max: 77). Half of the sample had secondary school, and 43% reported university as their highest level of education (see Table 1). Overall, 42.8% of participants had an average standard of living, 41.9% was living above, and 14.4% below the average standard of living. About half of the participants were in full time employment (48%), 40% was unemployed, and the rest worked less than full time.

3. 2. Prevalence of CBD and group differences in demographics

Overall, $n=125$ (8.7%; 95% CI 7.3-10.3) of the participants scored 42 or higher on the ECBS-R and were therefore considered as having CBD. Table 1 shows that visitors with CBD were younger ($r=-0.165$, $p<0.001$), more often female ($OR=2.07$, $p<0.001$) and less educated than non-compulsive visitors ($\chi^2=12.24$; $p<0.001$).

3. 3. Construct validity CBD

3.3.1. General distress, well-being and self-esteem related to CBD

As depicted in Table 2, compulsive buyers reported generally worse well-being and higher psychological distress than non-compulsive buyers with moderate to large standardised effect sizes. They are also more likely to have low self-esteem and high contingent self-esteem than non-compulsive buyers.

3.3.2. Addiction-related aspects: substance use, sensation seeking, impulsivity and obsessive-compulsive symptoms related to CBD

As described in Table 3, current compulsive buyers are more likely to use licit and illicit substances than non-compulsive buyers. They are also more likely to smoke regularly, and to have more problematic drinking habits. Compulsive buyers are also more likely to have been experimenting with illicit substances, including cannabis, amphetamine, cocaine, as well as to take medication and alcohol at the same time compared to non-compulsive buyers.

Compulsive buyers report to have higher impulsivity (especially on the Self-control subscale), obsessive-compulsive symptoms and higher sensation seeking than non-compulsive buyers (see Table 4) with moderate to large standardized effect sizes.

3.3.3.. Consequences of CBD

Table 5 shows that there is a significant difference between compulsive and non-compulsive buyers in terms of frequency of shopping and time spent shopping and time spent strolling, although CBD visitors do not have more credit cards than non-compulsive buyers and they do not have more credit card debts.

Women with CBD reported to have shopped for clothes/shoes more than non-compulsive female shoppers (2.7% vs. 11.3%; OR=4.5 95% CI:2.1-9.7) in the past month, but there were no differences in bags, cosmetics, décor and jewellery. Compulsive buyer men, on the other hand, shopped for bags (0.1% vs. 3.5%; OR=1.1 95% CI:1.0-1.1), cosmetics (1.8% vs. 10.7%; OR=6.7, 95% CI:1.7-26.3), décor (0.2% vs.7.1%; OR=39.2, 95% CI: 3.4-445.9) and jewellery (0.1% vs. 7.1%; OR=1.1 95% CI:1.1-1.2) more than their non-compulsive counterparts, but not for clothes/shoes. There were no gender differences in shopping for groceries, electronics and perfume.

3. 6. Borderline personality disorder related CBD

Compulsive buyers scored higher on the MSI-BPD than non-compulsive buyers ($M_{BPD}= 4.5$ $SD_{BPD}=2.5$, $M_{non-BPD}=2.3$ $SD_{non-BPD}=2.2$, $t=-9.30$, $p<0.001$, Cohen's $d=0.93$). While “only” 6.4% ($n=78$) of non-compulsive buyers had BPD, 34.8% ($n=31$) of compulsive buyers had BPD according to the screening test (OR=5.4, 95%CI:) than non-compulsive buyers.

4. DISCUSSION

Overall 8.7% of shopping mall visitors can be classified as having a compulsive buying disorder. Despite previous theoretical criticism, we found robust evidence for the construct validity of CBD as a mental disorder (high levels of distress and low self-esteem), as an addiction (elevated levels of impulsivity, obsessive-compulsive symptoms, sensation seeking and increased likelihood of experimenting with licit and illicit substances) and as an obsessive-compulsive disorder (preoccupation of shopping activity, significant psychological distress and elevated levels of impulsivity and obsession-compulsion).

The prevalence of CBD in our study is much lower than those reported in the previous studies in shopping mall visitors in France and Australia (33% and 37%, Lejoyeux et al., 2007; Phau and Woo, 2008) which is in line with our hypothesis. This difference is due to the fact that the instruments used in previous studies captured current as well as lifetime occurrence of CBD while in the present study we have only addressed current behaviour and feelings. The current prevalence is, however, higher than the prevalence obtained by another instrument, the QABB in the same sample (2.5%, Maraz et al., submitted). This is likely to reflect the different content of the questionnaires, for example the fact, that QABB contains items related to over-spending, which, however, is not related to CBD according the current findings.

Compulsive buying disorder is partly linked to demographic variables which is consistent with previous findings (Black, 2001, 2007). Young people and women are more prone to develop CBD than older people and men, although these associations are rather weak. Compulsive buyers are more likely to be less educated than non-compulsive buyers. Contrary to previous findings (Black, 2007; Koran et al., 2006), however, CBD is not directly and linearly linked to socio-economic status or net income. Therefore, definitions and questionnaires which refer to monetary means are unreliable indicators of CBD. Furthermore, we found that CBD is not associated with family status or place of residence.

CBD is, however, a mental health problem associated with substantially higher general psychiatric distress and lower self-esteem. This is in line with our expectations as well as with previous findings (Dittmar, 2005; Faber and O'Guinn, 1989; Faber and O'Guinn, 2008; Hanley and Wilhelm, 1992; Koran et al., 2006; Yurchisin and Johnson, 2004). This result provides support for CBD to be acknowledged as a mental health problem requiring clinical recognition and treatment. Additionally, the finding that compulsive buyers are more prone to

base their self-esteem on others' evaluation may be the reason why compulsive buyers often shop for gifts to impress others (Lejoyeux et al., 2008).

Again, consistent with our expectations, we found strong evidence that CBD is an addiction problem. Regarding comorbid substance use, compulsive buying is associated with smoking and alcohol use as well as experimenting with cannabis, amphetamine, cocaine and using alcohol with medication. Additionally, compulsive buyers report highly elevated levels of impulsivity and similarly high levels of obsessive-compulsive symptoms. These findings provide strong support for the notion that CBD is a reward-based approach behaviour characterised by impulsivity and sensation seeking. On the other hand, CBD also has avoidance components driven by internal tension such as low self-esteem and high distress reflected by elevated levels of obsession-compulsion. These findings support the placement of CBD in the obsessive-compulsive spectrum (Hollander et al., 1996), rather than being just an impulse-control disorder (Black, 2007; Grant, 2008; Grant et al., 2005; McElroy et al., 1994). Finally, these findings also suggest that CBD as a behavioural addiction shares at least some of the pathophysiological mechanism of substance use disorders (Grant et al., 2010).

At the same time our hypothesis regarding the consequences of CBD gained only partial confirmation. Compulsive buyers indeed shop more often and spend more time shopping and strolling than non-compulsive buyers, however, they do not have more credit cards contrary to previous conceptualisations of the disorder (O'Guinn and Faber, 1989; Roberts and Jones, 2001). In addition, they do not shop more online than non-compulsive visitors which supports the notion that it is the experience of browsing which characterises the disorder, rather than the purchase itself. Furthermore, it can not be excluded that financial consequences may only develop at later stages of CBD, which were captured by those studies which assessed lifetime (or mixed) prevalence of CBD instead of current.

As predicted, compulsive buying is strongly associated with borderline personality traits. In fact, those addicted are over five times more likely to have a borderline personality disorder than non-compulsive shoppers. This is also in line with previous findings reporting strong relationship between CBD and BPD symptoms (Sansone et al., 2011; Sansone et al., 2012; Sansone and Wiederman, 2012). This finding provides further support for the inclusion of CBD as an example of the impulsivity symptom of BPD in DSM-5 (American Psychiatric Association, 2013).

Our study has both strengths and limitations. The most important strengths include the use of a validated CBD questionnaire, the large sample size, the broad range of construct validators using instruments with good reliability and proven validity, and the correction for

multiple comparisons in our analyses. Limitation is the low response rate. The problem of low response in mailing studies has been recognised in the literature (12% on average, Johnson and Owens, 2003). However, because behaviours associated with impulse control disorders are stigmatized and often denied (Grant et al., 2005), compulsive buyers were probably more likely to refuse participation in the study. Therefore the observed frequency of CBD is likely to be an underestimation of the real prevalence of CBD among visitors of the shopping malls. Another limitation comes from the cross-sectional nature of data and the inability to establish causal links. By applying longitudinal design, future studies should address the question whether CBD leads to distress or vice versa. Furthermore, findings regarding illicit substance use should be treated with caution given that we only assessed experimenting, as an indicator, and not substance abuse and/or dependence. Finally, given the robust differences in the distress rates between compulsive and non-compulsive buyers, future studies should address the question whether CBD is a problem in itself or “only” a symptom of another mental disorder such as mania or borderline personality disorder.

5. CONCLUSION

Overall, we have found robust support of CBD to be a frequent disorder in shopping mall visitors with robust indicators supporting the psychopathological validity of the construct. Given our findings that (1) the behaviour encompasses impulsive as well as compulsive traits with equal robustness and (2) that CBD is associated with preoccupation of shopping activity (frequency of shopping and browsing) rather than actual buying behaviour (i.e. credit card use and income), we suggest adopting the term “shopping disorder” instead of compulsive buying disorder. This is also in line with and supports the change of terminology in the new DSM-5 (American Psychiatric Association, 2013). Shopping disorder is a behavioural addiction, which is characterised by preoccupation of shopping behaviour and is associated with significant psychological distress and may result in financial difficulties.

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Table 1: Demographical characteristics of the sample and group differences

	Total (n=1441)	CB+ (n=125)	CB- (n=1316)	Group difference (CB+ vs. CB-)
Age	31.14 (SD:12.1)	26.8 (SD: 8.3)	31.5 (SD:12.3)	t=5.714*
Gender (women)	62.6%	77.6%	61.1%	$\chi^2=13.27^*$
Education				
lower than 12 classes	8.2%	14.4%	7.6%	$\chi^2=12.24^*$
12 classes (secondary school)	49.1%	55.2%	48.6%	
university degree	42.8%	30.4%	43.8%	
SES^a	3.63 (SD:0.93)	3.67 (SD: 1.1)	3.63 (SD:0.9)	$\chi^2=3.606$
Net income^{b,c}	3.10 (SD:1.9)	2.89 (SD: 1.7)	3.12 (SD: 1.9)	$\chi^2=10.887$
Family status				
single	37.9%	50%	37%	$\chi^2=9.103$
in a relationship	32.2%	34%	32%	$\chi^2=0.116$
married or co-habiting	24.4%	14%	26%	$\chi^2=8.692$
divorced or widowed	5.5%	2%	6%	$\chi^2=2.464$
Place of residence				
Budapest	61.1%	68.8%	60.2%	$\chi^2=3.512$
City/town other than Budapest	28.6%	20.8%	29.5%	$\chi^2=4.195$
Village	10.2%	10.4%	10.3%	$\chi^2=0.002$

Note: * $p < 0.002$; CB+=compulsive buyers, CB-=non-compulsive buyers;

^aSES=socioeconomic status ('How wealthy are you compared to others?') rated 1-7 where 1= among the poorest, 7=among the wealthiest; ^bcategories were 1=less than 50,000HUF, 2=50-100,000HUF, 3=100-150,00HUF, 4=150-200,000HUF, 5=200-300,000HUF, 6=300-400,000HUF, 7=400-500,000HUF, 8=above 500,000HUF; ^c10 000 HUF=44 USD

Table 2: General distress, well-being and self-esteem between groups

	CB+ Mean (SD) (n =125)	CB- Mean (SD) (n =1316)	Difference	Effect size (Cohen's d)
WBS-5	7.8 (2.8)	8.5 (2.9)	t=2.56	-0.25
BSI (Global Severity Index)	56.3 (36.7)	27.7 (26.9)	t=-10.98*	0.89
RSES	17.2 (4.8)	20.3 (5.1)	t=6.45*	-0.63
Contingent Self Esteem				
Relation-based	38.2 (7.5)	33.1 (7.6)	t=-7.00*	0.68
Competence-based	30.8 (6.3)	25.8 (6.3)	t=-8.22*	0.79

*Note: *p<0.002; CB+=compulsive buyers, CB-=non-compulsive buyers, WBS-5=Five-item Well Being Scale, BSI=Brief Symptom Inventory, RSES=Rosenberg Self-Esteem Scale*

Table 3: Licit and illicit substance use

	CB+ (n=125)		CB- (n=1316)		Statistics	
					OR	95% CI
Legal substances						
Do you smoke? (%)						
No	56,8		70,5		0.55	0.38-0.79
No, I quit	3,2		4,9		0.64	0.23-1.77
Yes, occasionally	13,6		10,0		1.42.	0.83-2.45
Yes, regularly	26,4		14,4		2.12*	1.39-3.25
AUDIT-C (Mean)	4.22 (SD:2.05)		3.45 (SD:2.04)		t=-4.023* (Cohen's d: 0.38)	
Illicit substances^a (%)						
	CB+		CB-		OR	95% CI
	never	yes	never	yes		
Cannabis/hashish	67,2	16,8	78,6	7,8	2.51*	1.49-4.22
Amphetamine	92,8	4,0	96,0	0,7	6.05*	1.99-18.35
Cocaine	95,2	2,4	98,6	0,2	16.35*	2.71-98.81
Opiates (heroin)	97,6	0,0	99,6	0,0	-	-
LSD or magic mushrooms	96,0	0,8	97,5	0,5	1.78	0.21-14.92
Steroids	98,4	0,0	98,9	0,4	0.91	0.90-0.93
Alcohol + medication	87,2	6,4	95,4	1,7	4.19*	1.82-9.63
Unprescribed medication	88,0	8,8	94,1	3,4	2.75	1.39-5.48
Mephedrone	96,8	1,6	99,2	0,2	10.79	1.51-77.30

Note: *Pearson Chi-Square $p < 0.002$, CB+=compulsive buyers, CB-=non-compulsive buyers; OR=Odds Ratio for using the given substance when CB is present/not present, CI=confidence interval of OR, ^a Have you used the given substances over the past 12 months? Those who have used the given substance but not in the past 12 months were excluded. AUDIT-C =Alcohol Use Disorders Identification Test Consumption

Table 4: Addiction-related characteristics across groups

	CB+ Mean (SD) (n=125)	CB- Mean (SD) (n=1316)	Difference	Effect size (Cohen's <i>d</i>)
BSSS	24.2 (6.3)	21.2 (6.0)	t=-5.18*	0.49
BIS (total)	46.3 (7.9)	39.1 (7.2)	t=-10.52*	0.95
Self-control	20.1 (4.2)	11.6 (2.9)	t=-4.85*	2.36
Impulsive behaviour	11.6 (2.9)	9.8 (2.7)	t=-7.16*	0.64
Impatience	14.7 (3.5)	11.2 (2.8)	t=-10.87*	1.10
BSI – Obsession- compulsion	7.6 (4.9)	3.9 (4.1)	t=-8.167*	0.82

*Note: *p<0.02, CB+=compulsive buyers, CB-=non-compulsive buyers, Scale, BSSS=Brief Sensation Seeking Scale, BIS=Barratt Impulsiveness Scale, BSI=Brief Symptom Inventory*

Table 5: Shopping habits

	Total (n=1441)	CB+ (n=125)	CB- (n=1316)	Group difference (CB+ vs. CB-)
Frequency of shopping				
monthly or more rarely	62.3%	48%	63.9%	$\chi^2=20.690^*$
weekly	31.7%	41.6%	30.5%	
daily	6%	10.4%	5.6%	
Time spent shopping on an average week				
less than 2 hours	72.6%	45.6%	74.9%	$\chi^2=44.34^*$
3-6 hours	22.7%	37.6%	21.2%	
7-21 hours	4.3%	12.8%	3.7%	
22 hours or more	0.4%	3.2%	0.1%	
Strolls without buying				
monthly or more rarely	49.7%	30.4%	51.6%	$\chi^2=55.45^*$
1-4 times a month	42.2%	46.4%	41.8%	
2-6 times a week	6.6%	17.6%	5.5%	
daily	1.5%	5.6%	1.1%	
Number of credit cards in credit				
0	89.9%	84.8%	90.4%	$\chi^2=8.18$
1	8.4%	11.2%	8.1%	
2 or more	1.8%	4%	1.4%	
Frequency of shopping online				
never	26.3%	21.6%	26.7%	$\chi^2=4.48$
once a year or more rarely	50.2%	30.4%	23.4%	
a few times a year	38.7%	36%	39%	
1-3 times a month	9.8%	11.2%	9.7%	
once or more than once a week	1.2%	0.8%	1.3%	

Note: CB+=compulsive buyers, CB-=non-compulsive buyers

Appendix: Edwards Compulsive Buying Scale Revised version (ECBS-R)

1. My spending habits are creating chaos in my life
2. I usually spend all of my money left after paying bills each month
3. I feel like I just have to spend money left after bills are paid
4. I feel "high" when I go on a buying spree
5. Shopping is fun!
6. I am preoccupied with shopping and spending
7. I cannot resist sales signs in window or shop displays, I just have to check them out
8. I go shopping and buy things as often as I can
9. I go on a buying binge when I'm upset, disappointed, depressed, or angry
10. I go shopping and buy things to celebrate
11. I feel guilty or ashamed after I go on a buying binge
12. I feel anxious after I go on a buying binge
13. I hide my spending habits and the things that I buy from family or friends
14. I buy things I don't need or won't use
15. I shop and spend even when I don't need anything
16. Many of the things I buy are never worn or used

All items are to be rated 1 (strongly disagree) to 5 (strongly agree)

Subscales:

Lack of control: items 1-3.

Mood modification: items 4-10.

Guilt: items 11-13.

Unnecessary buying: items 14-16.

Scoring:

Greater scores indicate more severe compulsive buying behaviour. Individuals scoring 42 or more are classified as compulsive buyers.