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Latent profile analysis and comorbidity in a sample of individuals with compulsive buying disorder

Astrid Mueller [a,b,*], James E. Mitchell [b], Donald W. Black [c], Ross D. Crosby [b], Kelly Berg [d], Martina de Zwaan [a]

[a] Department of Psychosomatic Medicine and Psychotherapy, University Hospital of Erlangen, Germany
[b] Neuropsychiatric Research Institute and Department of Clinical Neuroscience, University of North Dakota, School of Medicine and Health Sciences, Fargo, ND, USA
[c] Department of Psychiatry, University of Iowa Roy J. and Lucille A. Carver College of Medicine, IA, USA
[d] Department of Psychiatry, University of Minnesota, MN, USA

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ABSTRACT

The aims of this study were to perform a latent profile analysis in a sample of individuals with compulsive buying, to explore the psychiatric comorbidity, and to examine whether or not more severe compulsive buying is associated with greater comorbidity. Compulsive buying measures and SCID data obtained from 171 patients with compulsive buying behavior who had participated in treatment trials at different clinical centers in the U.S. and Germany were analyzed. Latent profile analysis produced two clusters. Overall, cluster 2, included subjects with more severe compulsive buying, and was characterized by higher lifetime as well as current prevalence rates for Axis I and impulse control disorders. Nearly 90% of the total sample reported at least one lifetime Axis I diagnosis, particularly mood (74%) and anxiety (57%) disorders. Twenty-one percent had a comorbid impulse control disorder, most commonly intermittent explosive disorder (11%). Half of the sample presented with at least one current Axis I disorder, most commonly anxiety disorders (44%). Given the substantial psychiatric comorbidity, it is reasonable to question whether or not compulsive buying represents a distinct psychiatric entity vs. an epiphenomenon of other psychiatric disorders.

1. Introduction

Compulsive buying ("oniomania") was first described by Kraepelin (1909). This disorder has received increasing attention from researchers and clinicians over the last two decades and has been the subject of several reviews (see for example Black, 2007). McElroy et al. (1994) proposed diagnostic criteria for compulsive buying, characterizing the disorder as frequent buying episodes or impulses to buy that are experienced as irresistible, or senseless. The inappropriate buying behavior and impulses lead to personal distress, social, marital, or occupational dysfunction, and financial or legal problems. The excessive buying behavior does not occur exclusively during episodes of mania or hypomania.

Compulsive buying appears to be common in the general population. The prevalence of compulsive buying has been estimated at 5.8% in U.S. (Koran et al., 2006), and at 7% in Germany (Neuner et al., 2005; Mueller et al., in press).

People with compulsive buying suffer from uncontrollable urges to shop or buy that are triggered by negative mood states (e.g. depressed mood, anxiety, boredom) and result in overspending typically prompted by feelings of guilt, shame, and remorse (Miltenberger et al., 2003). Chronic and repetitive failure in self-regulation is considered as causal for the inappropriate purchasing behavior (Faber and Vohs, 2004; Kellett and Bolton, 2009). Furthermore, endorsement of materialism appears an important underlying mechanism that may constitute a vulnerability factor with respect to compulsive buying (Dittmar, 2005).

The classification of compulsive buying remains controversial. The disorder is not included in contemporary classification systems such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) or the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Many researchers considered compulsive buying as an impulse control disorder not otherwise specified (ICD-NOS) (e.g., Grant et al., 2005). In DSM-IV, impulse control disorders include pathological gambling, pyromania, kleptomania, trichotillomania, intermittent explosive disorder, and ICD-NOS which may include compulsive buying, excessive internet usage, non-paraphilic sexual compulsion, and skin picking. Other researchers believe that compulsive buying best be viewed as an obsessive–compulsive spectrum disorder (OCSD) (Hollander and Allen, 2006; Dell'Osso et al., 2006; Ravindran et al., 2009). This is a proposed meta-category that clusters psychiatric conditions with overlapping phenomenology and course (Hollander et al., 2009). OCSDs include impulse control disorders, somatoform disorders, eating disorders, and some neurological disorders (e.g., Tourette syndrome). In addition, a different

* Corresponding author. Department of Psychosomatic Medicine and Psychotherapy, University Hospital of Erlangen, Schwabachanlage 6, D-91054 Erlangen, Germany. Tel.: +49 9131 8544890; fax: +49 9131 8534145.
E-mail address: astrid.mueller@uk-erlangen.de (A. Mueller).

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approach proposes a category including behavioral and substance addictions due to the suggested neurobiological link between behavioral addictions and substance use disorders that could include compulsive buying (Grant et al., 2006).

Previous research indicated that compulsive buying may be associated with elevated rates of Axis I disorders (McElroy et al. 1994, Schlosser et al. 1994, Black et al. 2000, Ninan et al. 2000). Comparison of those with compulsive buying seeking treatment in Germany and the U.S. showed that most participants met criteria for at least one lifetime Axis I disorder (Mueller et al., 2007). Up to now, four controlled studies have been published comparing psychiatric comorbidity among subjects with compulsive buying and normal buyers (Black et al. 1998; Christenson et al. 1994; Mitchell et al. 2002; Mueller et al., 2009). Overall, these studies suggested that compulsive buying is associated with substantial psychiatric comorbidity. However, as can be seen (Table 1), prevalence rates ranged widely among the studies owing to differences in assessments, sample selection, and sample size. Black et al. (1998) reported elevated rates of lifetime mood disorders. Christenson et al. (1994) found higher rates of lifetime anxiety disorders, substance use disorders, binge eating disorder, and impulse control disorders. Mitchell et al. (2002) found substance dependence as more frequent among persons with compulsive buying. Finally, Mueller et al. (2009) reported significantly higher prevalence rates of affective, anxiety, OCD, and eating disorders in participants with compulsive buying compared to community controls.

Compulsive buying has often been described as a comorbid psychiatric condition in individuals with other Axis I disorders. For example, Lejoyeux et al. (2005) found that compulsive buying was more common in persons with OCD than in controls. Fernàndez-Aranda et al. (2008) reported that lifetime ICDs were prevalent in women with a history of eating disorder. Patients most frequently suffered from co-occurring compulsive buying with lifetime prevalence rate of 11.8%. In an earlier study on women with bulimia nervosa, prevalence rates for compulsive buying of 17.6% were reported (Fernàndez-Aranda et al., 2006).

With regard to personality disorders, Schlosser et al. (1994) reported that 59% of individuals with compulsive buying ($n=46$) had at least one personality disorder. In a German study (Mueller et al., 2009), 22 of 30 subjects (73%) met criteria for at least one personality disorder, most commonly avoidant, depressive, obsessive–compulsive, and borderline personality disorder.

Impulse control disorders (ICDs) were assessed in two controlled trials. Christenson et al. (1994) found that 21% of 24 individuals with compulsive buying had a lifetime ICD (other than compulsive buying). Mueller et al. (2009) reported a rate of 23% with an ICD in their sample of 30 treatment-seeking women with compulsive buying. In this study, the high rate of comorbid ICDs was mainly due the high rate of intermittent explosive disorder (17%).

To our knowledge, the concept of heterogeneity among individuals with compulsive buying has been explored in two studies (DeSarbo and Edwards, 1996; Black et al., 2001). In the earlier study, DeSarbo and Edwards (1996) focused on the antecedents of compulsive buying. They analyzed self-rating data from 104 persons self-identified with compulsive buying and 101 community controls using a constrained clusterwise regression approach. For this study, compulsive buying was assessed using the Edwards Compulsive Buying Scale (Edwards, 1993). Analyses distinguished between two clusters: an internal (cluster 1) and an external (cluster 2) compulsive buying group. For the first group compulsive buying appeared driven by psychological concerns, such as low self-esteem, dependent personality style, and anxiety. In the second group, compulsive buying appeared motivated by aspects of the individuals' immediate environment such as materialistic values, an escape/avoidance method of coping, social isolation, and denial. Impulsiveness was high in both clusters.

Severity of compulsive buying was explored by Black et al. (2001) who analyzed self-rating and interview data from 44 individuals with compulsive buying identified using the Compulsive Buying Scale (CBS) developed by Faber and O'Guinn (1992). Assessment also included the Diagnostic Interview Schedule (DIS; Robins et al., 1989) for Axis I diagnoses, the Minnesota Impulse Control Disorder Interview (MIDI; Christenson et al., 1994), assessment of personality disorders, and self-report measures for depression and obsessive–compulsive traits. Several comparative analyses were performed within CBS quartiles. The results showed that the CBS severity was predicted by low income, avoidant personality disorder symptoms, depression, percent of purchases spent on sale items, and a lower likelihood of "lonely" or "sad/depressed" moods prompting buying. However, the generalizability of the findings was limited by the small sample size, the assessment of buying severity based only on a single self-rating instrument, and the use of the DIS to assess Axis I disorders that is not designed for clinical samples (Black et al., 2001).

The purposes of the current study were to: 1) examine the psychiatric comorbidity in a larger sample of individuals with compulsive buying; 2) attempt to identify clusters based on severity of compulsive buying; and 3) examine whether or not more severe compulsive buying is associated with greater psychiatric comorbidity.

Table 1
Results of controlled studies in treatment-seeking participants with compulsive buying disorder: rates of psychiatric disorders lifetime.

Dx, lifetime	References			
	Christenson et al. (1994)	Black et al. (1998)	Mitchell et al. (2002)	Mueller et al. (2009)
	Sample size			
	$n=24$	$n=33$	$n=19$	$n=30$
	Assessment			
	SCID SM-III-R	SCID DSM-III-R	SCID DSM-IV	SCID DSM-IV
	Rates of lifetime prevalence [%]			
Any affective disorder	54	64[a]	58	80[a]
Major depression	50	61	53	57
Any substance use/ dependence	46[a]	21	53[a]	23
Alcohol abuse/ dependence	46	18	47	17
Any anxiety disorder	50[a]	42	53	87[a]
Social phobia	21	9	16	57
OCD	13	3	16	40
Any eating disorder	21[a]	15	5	33[a]
Binge eating disorder	17	–	–	27

[a] Significant difference between treatment-seeking patients with compulsive buying and control subjects. $P<0.05$.

2. Methods

2.1. Subjects

Data were obtained using compulsive buying measures and SCID data obtained from patients with compulsive buying behavior who had participated in treatment trials at different clinical centers in the U.S. and Germany. Participants were recruited through newspaper advertisements, local TV, and radio interviews inviting interested individuals to participate in treatment programs for compulsive buying. Inclusion criteria included meeting the criteria of McElroy et al. (1994) and being 18 years or older. Exclusion criteria were active suicidal ideation and current mania or hypomania. In all patients, compulsive buying was the primary psychiatric problem.

Seventy-three individuals (age: mean 45.9 years, S.D. = 10.6; 99% female) had been recruited for psychotherapy studies at the Neuropsychiatric Research Institute, Fargo, N.D. Thirty-nine participants had been assessed as part of a pilot CBT study in 2002/2003 (Mitchell et al., 2006), and 34 patients were assessed within an ongoing CBT study in 2008/2009. Fourteen individuals (age: mean 43.2 years, S.D. = 11.7; 93% female) had been recruited for treatment studies at the University of Minnesota. The screening for 8 patients was conducted in 2000, and 6 participants had answered the questionnaires in 2008/2009 within an ongoing CBT study. Twenty patients (age: mean 41.2 years, S.D. = 11.5; 100%

female) had been recruited for a medication study at the University of Iowa in 2000 (Black et al., 2000). Data were also obtained from 64 participants (age: mean 41.1 years, S.D. = 10.4; 84% female) in a CBT study conducted at the University Hospital of Erlangen, Germany (Mueller et al., 2008).

Written informed consent had been obtained from all participants at their study site. The current study, which consisted of secondary analyses, was approved by the Institutional Review Board of the University of North Dakota.

2.2. Assessments

All assessments were conducted at baseline before the beginning of treatment. Assessments were conducted face to face by masters or doctoral level assessors who were all experienced in working with patients and had been trained in the administration and scoring of the instruments.

Compulsive buying symptoms were assessed using the Compulsive Buying Scale and the Yale–Brown Obsessive Compulsive Scale modified for compulsive buying.

2.2.1. Compulsive Buying Scale (CBS)

The CBS (Faber and O'Guinn, 1992) is a screening instrument, which consists of seven items exploring specific behaviors, motivations, feelings, and financial aspects associated with buying. Lower scores indicate a more severe compulsive buying, whereas a cut-off score equal to −1.34 indicates an individual with compulsive buying. For the German sample, a German version of the CBS was used (Mueller et al., 2009). The coefficient alpha value in the current study was 0.67.

2.2.2. Yale–Brown Obsessive Compulsive Scale—Shopping Version (YBOCS-SV)

The YBOCS-SV (Monahan et al., 1996) is based on the Yale–Brown Obsessive Compulsive Scale (YBOCS; Goodman et al., 1989). The YBOCS-SV focuses on the severity and frequency of compulsive buying. This scale also measures interference caused by cognitions and behaviors related to compulsive buying (e.g. repetitive inadequate buying, intrusive thoughts about buying, and resistance to such thoughts) but does not address the financial consequences. A validated German version of the YBOCS exists (Hand and Büttner-Westphal, 1991) with a proposed cut-off of 16. The coefficient alpha value for the total score in the current study was 0.83.

2.2.3. Structured Clinical Interview for DSM-IV Axis I disorders (SCID)

Psychiatric comorbidity was assessed using the SCID (American Psychiatric Association, 1994). In the German sample the German adaptation of the SCID (Wittchen et al., 1997) was utilized. ICDs were evaluated using the SCID module for impulse control disorders, which includes provisional criteria for the DSM-IV impulse control disorders kleptomania, intermittent explosive disorder, pathological gambling, pyromania, trichotillomania, and compulsive buying (First et al., 1996). This interview module was translated by the first author for use in the German CBT study (Mueller et al., 2008). Interrater reliabilities for the interviews or for each disorder were not computed. Because data on personality disorders were available only as the German site, Axis II diagnoses were not included.

2.3. Statistics

Statistical analyses were conducted with the statistical program SPSS 17.0 and Latent Gold version 4.5 software. Latent profile analysis (LPA) (Lazarsfeld and Henry, 1968) was performed on the total sample. Indicator variables for the LPA included the seven items of the CBS, and the 10 items of the YBOCS-SV. Determination of the number of clusters was based on minimization of the BIC, sample size-adjusted BIC, and the consistency AIC parsimony indices, as well as minimization of cross-classification probabilities. Assignment of cluster membership was based on Bayesian probabilities.

Comparisons between clusters on continuous variables were conducted by parametric tests. All comparisons between clusters were controlled for gender. Clusters were compared on current and lifetime comorbidity using Chi^2 tests. Differences in rates of SCID diagnoses were assessed within the following major categories: any affective disorder, any substance use disorder, any anxiety disorder, any somatoform disorder, any eating disorder, any Axis I disorder, and any ICD. Because of multiple comparisons the significance level was set up at $P<0.01$.

3. Results

3.1. Descriptive characteristics of the total sample

The total sample consisted of 171 participants with compulsive buying. The mean age was 43.3 years (S.D. 10.9), with a range from 19 to 71 years. Of the 171 participants 159 (93.0%) were women. The mean score on the CBS was −4.23 (S.D. 1.77), and the YBOCS-SV score was 21.09 (S.D. 5.99). Female and male participants did not differ in age, CBS or YBOCS-SV scores.

As can be seen in Table 2, the six sub-samples did not differ regarding CBS and YBOCS-SV levels. No significant differences in compulsive buying measures were found after merging the sub-samples with regard to sites (Fargo, Minneapolis, Iowa City, Erlangen and U.S., Germany). Although the six sub-samples did not differ in gender distribution, we found significant differences in the merged samples. Frequencies of female participants if the total sample was divided into four sites were: Fargo 98.6%, Minneapolis 92.9%, Iowa 100%, and Germany 84.4 ($P<0.01$). The U.S. sample consisted of 105 and the German sample of 54 women (98.1% vs. 84.4%; $P<0.005$ respectively). By splitting into two sub-samples the rates of women were: U.S. 98.1% and Germany 84.4% ($P<0.005$). For this reason all analyses reported in Table 2 have been controlled for gender.

3.2. Latent profile analysis (LPA) of the dimensional assessment of compulsive buying symptoms

The LPA produced two clusters that showed significantly different means on the CBS and the YBOCS-SV. Cluster 2, which contained 64 subjects, was characterized by significantly higher scores than cluster 1, which contained 107 participants, on the YBOCS-SV and significantly lower scores on the CBS (see Table 3). Because higher scores on the YBOCS-SV and lower scores on the CBS indicate more severe compulsive buying, cluster 2 includes individuals with more severe compulsive buying. Cluster membership was not associated with age and gender. As can be seen in Table 4, there were no significant differences in sample distribution between the two clusters.

3.3. Prevalence of current and lifetime psychiatric disorders in the total sample

Table 5 presents the lifetime prevalence rates of psychiatric disorders for the total sample. Nearly 90% of the sample reported at least one lifetime Axis I diagnosis. The most common were mood disorders (74.3%), especially major depressive disorder (62.6%), and anxiety disorders (57.3%), particularly social phobia (28.1%) and panic disorder (24.6%). In 146 cases data on lifetime ICDs were available. Of

Table 2
Comparison of compulsive buying measures between sub-samples and sites.

Comparison between sub-samples/sites						
		N	MEAN	S.D.	ANOVA	
Sub-samples (n = 6)						
CBS	Fargo 2002–2003	33	−3.72	1.79	$F_{5,167}=1.94$	$P=0.091$
	Fargo 2008–2009	34	−4.54	1.51		
	Minneapolis 2000	7	−4.43	1.77		
	Minneapolis 2008–2009	6	−3.20	1.59		
	Iowa 2000	18	−4.95	1.27		
	Erlangen 2005–2007	64	−4.26	1.95		
YBOCS-SV	Fargo 2002–2003	33	22.27	7.21	$F_{5,163}=1.27$	$P=0.28$
	Fargo 2008–2009	34	19.68	6.09		
	Minneapolis 2000	7	17.43	6.40		
	Minneapolis 2008–2009	6	20.67	1.37		
	Iowa 2000	20	21.35	3.30		
	Erlangen 2005–2007	64	21.58	6.00		
Sites (n = 4)						
CBS	Fargo	73	−4.10	1.70	$F_{3,167}=1.32$	$P=0.27$
	Minneapolis	13	−3.86	1.74		
	Iowa	18	−4.95	1.27		
	Erlangen	64	−4.26	1.95		
YBOCS-SV	Fargo	67	20.96	6.74	$F_{3,167}=0.73$	$P=0.54$
	Minneapolis	13	18.92	4.91		
	Iowa	20	21.35	3.30		
	Erlangen	64	21.58	6.00		
Sites (n = 2)						
CBS	U.S.	104	−4.22	1.66	$F_{1,167}=0.02$	$P=0.90$
	Germany	64	−4.26	1.95		
YBOCS-SV	U.S.	100	20.77	5.99	$F_{1,163}=0.71$	$P=0.40$
	Germany	64	21.58	6.00		

Note. CBS = Compulsive Buying Scale (lower levels indicate higher levels of compulsive buying). YBOCS-SV = Yale–Brown Obsessive Compulsive Scale—Shopping Version.

Table 3
Comparison of age, gender and compulsive buying measures between clusters.

	Total sample $N=171$		Cluster I (CB) $N=107$		Cluster II (Severe CB) $N=64$		Comparison Cluster I vs. Cluster II	
	N	%	*N*	%	*N*	%	Chi^2 test	
Gender: female	159	93.0	100	93.5	59	92.2	Ns	
Gender: male	12	7.0	7	6.5	5	7.8		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	ANOVA	
CBS	−4.23	1.77	−3.28	1.57	−5.78	0.63	$F_{1,167}=147.80$	$P<0.001$
YBOCS-SV	21.09	5.99	18.40	5.19	25.28	4.60	$F_{1,167}=74.86$	$P<0.001$
Age	43.31	10.85	44.09	11.81	42.00	8.94	$F_{1,168}=1.48$	$P=0.23$

Note. CB = Compulsive Buying.

these subjects, nearly 20% had an ICD, most commonly intermittent explosive disorder (11.0%).

With regard to current psychiatric disorders, half of the total sample presented with at least one current Axis I disorder (see Table 6). The most common category was current anxiety disorders (44.4%), including 39 (22.8%) individuals with social phobia. Twenty-four subjects of 146 (16.6%) met criteria for at least one current ICD, most commonly intermittent explosive disorder (10.3%).

3.4. Comparison of the LPA clusters on psychiatric comorbidity

Overall, those in were characterized by higher lifetime as well as current prevalence rates. Table 5 summarizes the lifetime prevalence rates of psychiatric disorders by clusters. Participants in cluster 2 reported a significantly higher number of lifetime Axis I disorders per subject compared with cluster 1 (mean 4.14, S.D. 2.90 and mean 2.37, S.D. 2.26, respectively; $F_{1,170}=19.69$, $P<0.001$). Cluster 2 subjects were more likely to meet criteria for any lifetime Axis I and reported substantially higher lifetime prevalence rates of mood disorders, anxiety disorders, substance use disorders, and binge eating disorder. However, based on a significance level of $P<0.01$ only the difference in prevalence of any lifetime anxiety disorder reached statistical significance.

Prevalence rates of current psychiatric comorbidity by clusters are presented in Table 6. Significant between cluster differences in the rates of any current Axis I disorder were found, most notably on current anxiety disorders. Subjects in cluster 2 presented with a significantly higher number of current Axis I diagnoses per subject compared with those in cluster 1 (mean 2.59, S.D. 2.63 and mean 1.21, S.D. 1.70, respectively; $F_{1,170}=17.26$, $P<0.001$).

4. Discussion

These findings are the first to explore the severity and psychiatric comorbidity of compulsive buying in a larger sample collected from multiple sites. The samples did not differ in symptoms of compulsive buying as assessed with the CBS and the YBOCS-SV. The results of this study support and extend the earlier findings and suggest that treatment-seeking persons with compulsive buying present with similar levels of compulsive buying measured across different sites (Mueller et al., 2007).

Overall, our findings on psychiatric comorbidity are consistent with earlier studies suggesting high rates among individuals with compulsive buying. Nearly 90% of subjects reported a lifetime history of any Axis I disorder, 51% met criteria for a current Axis I disorder, and 21% presented with a lifetime diagnosis of an ICD (other than compulsive buying). Mood disorders were the most common comorbid lifetime disorders, and anxiety disorders exhibited the

Table 4
Sample distribution between clusters.

	Total sample $N=171$		Cluster I (CB) $N=107$		Cluster II (Severe CB) $N=64$		Comparison Cluster I vs. Cluster II
	N	%	*N*	%	*N*	%	Chi^2 test
Sites (n=2)							
U.S.	107	62.6	72	67.3	35	54.7	ns
Germany	64	37.4	35	32.7	29	45.3	
Sites (n=4)							
Fargo	73	42.7	52	48.6	21	32.8	ns ($P=0.042$)
Minneapolis	14	8.2	11	10.3	3	4.7	
Iowa	20	11.7	9	8.4	11	17.2	
Erlangen	64	37.4	35	32.7	39	45.3	

Table 5
Lifetime psychiatric comorbidity.

Dx, lifetime	Total sample		Cluster I (CB)		Cluster II (Severe CB)		Comparison Cluster I vs. Cluster II
	$N=171$		$N=107$		$N=64$		P (Chi^2 test)
	N	%	*N*	%	*N*	%	
Any Axis I disorder	153	89.5	90	84.1	63	98.4	0.003
Any lifetime affective disorder	127	74.3	73	68.2	54	84.4	0.019
MDD	107	62.6	61	57.0	46	71.9	
Bipolar I disorder	3	1.8	1	0.9	2	3.1	
Bipolar II disorder	5	2.9	1	0.9	4	6.2	
Any dependence	35	20.5	16	15.0	19	29.7	0.021
Alcohol	24	14.0	13	12.1	11	17.2	
Sedative	8	4.7	4	3.7	4	6.2	
Cannabis	11	6.4	3	2.8	8	12.5	
Stimulants	4	2.3	2	1.9	2	3.1	
Opioid	7	4.1	4	3.7	3	4.7	
Cocaine	3	1.8	2	1.9	1	1.6	
Hallucinogen	3	1.8	1	0.9	2	3.1	
Any anxiety disorder	98	57.3	52	48.6	46	71.9	0.003
Panic disorder	42	24.6	19	17.8	23	35.9	
Social phobia	48	28.1	26	24.3	22	34.4	
Specific phobia	33	19.3	14	13.1	19	29.7	
OCD	32	18.7	18	16.8	14	21.9	
PTSD	23	13.5	9	8.4	14	21.9	
Any eating disorder	34	19.9	17	15.9	17	26.6	0.091
Anorexia nervosa	4	2.3	1	0.9	3	4.7	
Bulimia nervosa	13	7.6	8	7.5	5	7.8	
Binge eating disorder	24	14.0	10	9.3	14	21.9	
	$N=146$		$N=95$		$N=51$		
	N	%	*N*	%	*N*	%	P (Chi^2 test)
Any impulse control disorder[a]	30	20.5	16	16.8	14	27.5	0.130
Kleptomania	9	6.2	3	3.2	6	11.8	
Intermittent explosive disorder	16	11.0	9	9.5	7	13.7	
Pathological gambling	8	5.5	4	4.2	4	7.8	
Pyromania	0	0	0	0	0	0	
Trichotillomania	3	2.1	2	2.1	1	2.0	

Note. Because of multiple comparisons the significance level was set up at $P<0.01$.
[a] Other than compulsive buying.

Table 6
Current psychiatric comorbidity.

Dx, current	Total sample		Cluster I (CB)		Cluster II (Severe CB)		Comparison Cluster I vs. Cluster II
	$N=171$		$N=107$		$N=64$		P (Chi^2 test)
	N	%	*N*	%	*N*	%	
Any Axis I disorder	102	50.9	53	49.5	49	76.6	<0.001
Any affective disorder	56	32.7	27	25.2	29	45.3	0.007
MDD	26	15.2	12	11.2	14	21.9	
Bipolar I disorder	0	0	0	0	0	0	
Bipolar II disorder	2	1.2	0	0	2	3.1	
Dysthymia	32	18.7	15	14.0	17	26.6	
Any abuse/dependence	3	1.8	1	0.9	2	3.1	0.291
Alcohol	2	1.2	1	0.9	1	1.6	
Sedative	0	0	0	0	0	0	
Cannabis	0	0	0	0	0	0	
Stimulants	0	0	0	0	0	0	
Opioid	0	0	0	0	0	0	
Cocaine	0	0	0	0	0	0	
Hallucinogen	0	0	0	0	0	0	
Any anxiety disorder	76	44.4	37	34.6	39	60.9	0.001
Panic disorder	22	12.9	9	8.4	13	20.3	
Social phobia	39	22.8	18	16.8	21	32.3	
Specific phobia	29	17.0	12	11.2	17	26.6	
Generalized anxiety disorder	26	15.2	9	8.4	17	26.6	
OCD	25	14.6	13	12.1	12	18.8	
PTSD	15	8.8	5	4.7	10	15.6	
Any somatoforme disorder	15	8.8	6	5.6	9	14.1	0.059
Somatization disorder	7	4.1	2	1.9	5	7.8	
Pain disorder	9	5.3	5	4.7	4	6.2	
Hypochondriasis	4	2.3	3	2.8	1	1.6	
Body dysmorphic disorder	2	1.2	0	0	2	3.1	
Any eating disorder	20	11.7	9	8.4	11	17.2	0.084
Anorexia nervosa	0	0	0	0	0	0	
Bulimia nervosa	5	2.9	3	2.8	2	3.1	
Binge eating disorder	16	9.4	6	5.6	10	15.6	
	N	%	*N*	%	*N*	%	P (Chi^2 test)
Any impulse control disorder (without CB) [a]	24	16.6	13	13.8	11	21.6	0.231
Kleptomania	7	4.8	2.1	3.2	5	9.8	
Intermittent explosive disorder	15	10.3	8	8.5	7	13.7	
Pathological gambling	4	2.8	2	2.1	2	3.9	
Pyromania	0	0	0	0	0	0	
Trichotillomania	3	2.1	2	2.1	1	2.0	

Note. Because of multiple comparisons the significance level was set up at $P<0.01$.
[a] Other than compulsive buying.

highest prevalence at the time of evaluation. The findings do not clarify the direction of the relationship between compulsive buying, anxiety, and mood disorders. The question whether anxiety and depressive symptoms make individuals more vulnerable for compulsive buying, or whether compulsive buying leads to or increases anxiety and depression, is unresolved.

The LPA found evidence for two clusters. Approximately one-third of the sample was assigned to the sub-group which had a more severe profile of compulsive buying symptoms. Our results are mostly in line with the previous findings from the study of Black et al. (2001) which suggested that more severe compulsive buying was associated with higher rates of psychiatric comorbidity. With regard to the results of comparison of the two clusters on comorbidity, it appears that especially anxiety and mood disorders are associated with more severe compulsive buying.

There are several limitations to acknowledge. Although this investigation is one of the largest studies of compulsive buying typologies to date, the sample size of 171 remains modest for a LPA, and a larger sample size would have provided greater statistical power to detect small to moderate effect size differences between sub-groups. It is possible that more clusters might have emerged if additional variables had been used, e.g. personality disorder diagnoses. Also, the comparison between clusters on other variables than SCID diagnoses might be of interest, e.g. on compulsive hoarding symptoms, and sociodemographic variables. Unfortunately, data on time of onset of compulsive buying and also of co-occurring Axis I disorders were not available. Furthermore, the conclusions on severity are restricted due to the cross-sectional rather than longitudinal assessments. We might expect that changes in compulsive buying symptoms measured over time would provide more valid data. However, based on data on reliability of the YBOCS-SV and the CBS we can assume a reasonable stability of these instruments. Monahan et al. (1996) had reported a moderate test–retest reliability ($r=0.59$, $P=0.10$) of the YBOC-SV in nine patients. With regard to the CBS, the test–retest reliability was assessed testing 82 psychiatric inpatients twice two weeks apart in another study (Mueller et al., in press). In this study, the between items correlations ranged from 0.759 to 0.850 whereas the Intraclass Correlation Coefficient of the CBS total scores between the two test intervals was 0.925.

Advantages of the present study include the relatively large sample of individuals with compulsive buying, and the fact that data were obtained at four different centers in the U.S. and Germany. Further, all participants met diagnostic criteria for compulsive buying (McElroy et al., 1994), and compulsive buying symptoms were assessed by self-rating (CBS) as well as the YBOCS-SV.

Our findings yield important clinical implications. Although compulsive buying causes serious individual distress and interferes with social functioning, the problem is still largely ignored in clinical practice. Individuals with compulsive buying are mostly embarrassed about their excessive buying behavior and tend to be secretive about it. It is important that clinicians inquire about compulsive buying. In addition, they should be aware about the psychiatric comorbidity in order to offer comprehensive treatment. We assume that patients with more severe compulsive buying suffer from more co-occurring mental disorders and may need different treatment than those with less severe compulsive buying.

Given the substantial psychiatric comorbidity, it is reasonable to question whether or not compulsive buying represents a distinct psychiatric entity vs. an epiphenomenon of other psychiatric disorders, e.g. anxiety and depression. From our clinical experience, in the majority of patients compulsive buying problems do not disappear by treating the co-occurring mental disorder. The chronic course is remarkable and delineates compulsive buying disorder as a distinct problem. In our opinion, compulsive buying should be considered a psychiatric disorder. Further research is needed to address this issue.

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