da Silva TL, et al., J Addict Behav Ther Rehabil 2015, 4:2
http://dx.doi.org/10.4172/2324-9005.1000137

Journal of Addictive Behaviors, Therapy & Rehabilitation

Review Article A SCITECHNOL JOURNAL

Compulsive Buying: Psychopathological Condition, Coping Strategy or Sociocultural Phenomenon? A Review

Tricia L da Silva[1,2*]

[1]*Institute of Medical Science, Faculty of Medicine, University of Toronto, Medical Sciences Building, 1 King's College Circle, Toronto, Ontario M5S 1A8, Canada*

[2]*Centre for Addiction and Mental Health, Division of Mood and Anxiety Disorders, 100 Stokes St., Toronto, Ontario M6J 1H4, Canada*

[*]**Corresponding author:** Tricia L. da Silva, MA, Centre for Addiction and Mental Health, Division of Mood and Anxiety Disorders, 100 Stokes St., Toronto, Ontario M6J 1H4, Canada, Tel: 1-416-535-8501 x36408; Fax: 1-416-583-1291; E-mail: tricia.dasilva@camh.ca

Rec date: December 13, 2014, **Acc date:** March 25, 2015, **Pub date:** March 27, 2015

Abstract

Objectives: Compulsive buying (CB) has been conceptualized variously as an obsessive-compulsive, impulse control, or addictive spectrum condition; as a coping strategy for negative mood; and as a mere phenomenon of materialistic societies. The objective of this review was to evaluate the published literature on CB from a biopsychosocial perspective, for support for its classification among these options.

Methods: A search of the psychiatric literature was conducted, using PubMed, ProQuest and EBSCOHOST, for all articles containing the terms "compulsive buying" or "compulsive shopping" and published in English up to February 2015. Articles were also obtained from secondary search engines like Google Scholar, and the citation lists of sourced articles were also searched for additional references.

Results: Preliminary neurobiological and pharmacological data suggest that CB may be best classified as a behavioural addiction. It is highly co-morbid with other Axis I disorders, including addictions, and there is also familial loading of CB among compulsive buyers. Its onset and maintenance is also strongly influenced by psychosocial factors (e.g. depression, easy access to credit), resulting in heterogeneous patient subgroups that likely differ in biopsychosocial etiology and treatment response. Combination of pharmacotherapy and CB-specific cognitive behaviour therapy may be an effective integrated treatment. However, societal values and practices challenge prophylaxis and relapse prevention.

Conclusions: Current data support the classification of compulsive buying as a behavioural addiction. However, the overall data is still limited and additional epidemiological, neurobiological, psychological and sociocultural research would greatly enhance understanding and management of this condition.

Keywords Compulsive buying; Compulsive shopping; Obsessive-compulsive disorder; Impulse control disorder; Substance use disorder; Behavioural addiction; Depression; Emotional dysregulation; Materialism

Introduction

Compulsive buying (CB) is characterized by a repetitive cycle of sudden, intense and irresistible urges to acquire consumer goods, following by uncontrolled and excessive buying of items that frequently go unused [1]. Though the activity is pleasurable in the moment, major long-term consequences of CB include impaired social and occupational functioning, significant emotional distress, and financial or legal complications – despite this, the excessive buying continues [2-4].

Early psychiatry textbooks by Emil Krapelin [5] and Eugen Bleuler [6] provide the first clinical descriptions of compulsive buying (CB). Kraepelin described it as a 'buying mania', while Bleuler categorized CB as an impulsive reactive disorder, alongside pyromania and kleptomania. However, CB received little clinical or research interest (other than from consumer behavior researchers) until the 1990s, when the first formal epidemiological data was published by mental health researchers [2,7]. The condition may have historical antecedents, however: Marie Antoinette, the ill-fated 18th century Queen of France; Mary Todd Lincoln, First Lady of the United States during the American Civil War of the mid-19th century; and William Randolph Hearst, American media mogul in the late 19th and early 20th centuries, were all known for extravagant spending that contributed to personal and financial difficulties [2]. In more recent times, similar allegations have been made about another American First Lady, Jacqueline Kennedy Onassis, and Diana, Princess of Wales [2].

The diagnostic criteria for CB currently used in clinical research were first proposed by McElroy et al. [4]: 1) Presence of persistent, maladaptive buying preoccupations, impulses and behaviour which are time consuming and cause impairment, 2) Impairment includes marked distress, social and occupational dysfunction, and/or financial or legal difficulties, and 3) The preoccupations, impulses and behaviours are not better accounted for by (hypo)mania. It is most commonly assessed using Faber & O'Guinn's Compulsive Buying Scale (CBS) [8], but other measures are also available, such as the Yale-Brown Obsessive Compulsive Scale – Shopping Version (Y-BOCS-SV) [9], the Canadian Compulsive Buying Measurement Scale (CCBMS) [10], the Edwards Compulsive Buying Scale (ECBS) [11], the Questionnaire about Buying Behavior (QABB) [12], the Richmond Compulsive Buying Scale (RCBS) [13], and the Minnesota Impulsive Disorder Interview (MIDI) [3], among others. These scales measure similar, though not identical, domains, namely: Buying thoughts and behaviours, negative personal/social/financial impact of excessive buying, and post-purchase guilt [1]. Subsequent to some growth in publications on CB, it was noted in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R) [14] under Impulse Control Disorders Not Otherwise Specified (following Bleuler's line of thinking). In contrast, in the DSM-5 [15], excessive buying is included as a specifier of Hoarding Disorder under Obsessive-Compulsive and Related Disorders. However, in the academic sphere, its exact classification continues to be debated. Mental health researchers have categorized it variously with obsessive-compulsive disorder (OCD), impulse control disorders (ICDs) and substance use disorders (SUDs), and have also linked it to depression

[1,16,17]. In contrast, many consumer behavior researchers consider CB to be merely a cultural phenomenon of developed societies (where it has solely presented, thus far), where consumerism is encouraged and glamourized as a way to achieve an ideal lifestyle or deal with life stressors, even if one cannot afford it [18,19].

The issue of classification has important clinical implications, as it could affect the degree of attention given to CB by the healthcare field, as well as the type and availability of treatment services for people seeking help for CB. There are few formal treatment programs for CB in developed countries, which may be due to the limited clinical and research attention paid to this condition, thus far. Prevention programs are almost non-existent. This status is likely to continue unless there are substantial changes in clinical and public conceptualization of and attitudes to CB.

This narrative review examines the published data on CB to determine whether there is support for its classification as some form of mental illness versus an epiphenomenon of psychological state or social culture. Literature on potential biopsychosocial contributors to its presentation and maintenance, and effective treatment strategies, is also examined.

Methods

A search of the psychiatric literature was conducted, using PubMed, ProQuest and EBSCOHOST, for all articles containing the terms "compulsive buying" or "compulsive shopping" and published in English up to February 2015. Supplementary search terms included, "phenomenology", "co-morbidity", "treatment", "neurobiology", "risk factors", "obsessive-compulsive disorder", "impulse control disorder", and "behavioural addiction", among others. Articles were also obtained from secondary search engines like Google Scholar, and the citation lists of sourced articles were also searched for additional references. A total of 4,459 publications were found through this method. Articles (reviews, controlled and uncontrolled trials, case reports; n=81) were included in this narrative review based on the significance of their findings and relevance of their information to the key topics described above. The literature search, article review and selection were conducted by the author. The resulting data is examined and discussed below.

Results

Epidemiology

Epidemiological data for CB comes only from developed countries [2]. The vast majority of the studies were small scale, with local community samples rather than a national catchment. As a result, prevalence data is quite divergent, with reported rates ranging from as low as 1% to as high as 32% [2,7]. Clinical studies have also generally reported CB to be significantly more prevalent in women, who comprise over 90% of patients with CB [3,4,20], but these also had small samples, and the gender difference may better attributed to the greater propensity of women to seek help for CB, than men [2,7]. Among the few population-based studies, two national population surveys reported prevalence rates of 6% and 7%, respectively, and no gender differences [21,22], while another national survey and a regional survey noted rates of 7% and 11%, respectively, and higher prevalence among women [23,24]. A general health population survey from the U.K. also found compulsive buyers to be predominantly female [25]. The CB population surveys also found significant associations between CB and younger age [21,22,24]. Paralleling this, age of onset has been found to be in late adolescence and early adulthood [3,20,26], which usually co-occurs with experience of greater personal and financial freedom (e.g. leaving the family home for university residence or first apartments, getting first jobs or credit cards) [2]. Race/ethnicity, marital status, size of household, education level and employment status have not shown any associations with CB [21,22]. However, correlations with income have been mixed, with some studies noting higher prevalence in those with lower income [20,26,27], while others found no such link [21,22]. However, as wealthier individuals are more likely to be able to afford high bills and may thus be less likely to seek help for CB or see it as a problem, any perceived differences between those with and without CB based on income may be illusory [18].

Phenomenology

In the literature, 'compulsive buying' and 'compulsive shopping' are often used as synonymous terms, but they relate to very different behaviours; while shopping (the act of looking for and evaluating goods) and buying (the act of purchasing goods) frequently co-occur, they can also take place independently of each other [28]. For compulsive buyers, the act of shopping (i.e. finding items for purchase), is only a part of the anticipatory process, which begins with the buying urge or preoccupation and the planning of a buying trip, and ends with an actual buying transaction [2]. This process appears to provide much more pleasure than actual possession or use of the items, or even what the items are, but the enjoyment is quite transitory and the aftermath is a significant letdown [1,2].

The course of illness in CB may be episodic or chronic [4,7]. Individuals with CB are usually solitary shoppers, with buying episodes that are triggered by the urge to purchase a specific item or simply to engage in buying, and that vary in frequency and duration by individual [3,20]. Choice of item also changes frequently, even shortly before the actual purchase [29]. Though the majority of individuals with CB report regular attempts to resist the buying urge, these are largely short-lived and unsuccessful, and usually result in a purchase within a few hours of experiencing the urge [3,20,30]. Shopping venues can be high priced or low priced, depending on the individual's inclination and purchasing power [2]. Greater severity of CB appears linked to lower income, but nonetheless, these individuals spend more on regular priced items than sale items [3,27]. Items are often non-essential and/or purchased in more quantity than needed, and are frequently little used or given away [3,4,20,31]. They also tend to be status symbols, such as cosmetics, clothing, collectibles, electronics and media, furniture, and jewellery [3,20,26].

Though compulsive buyers share many common traits and behaviours, as described above, heterogeneity of subgroups is notable. Differences in levels of compulsivity and impulsivity have been reported, with "compulsive-impulsive" buyers showing both a significant preoccupation with buying (i.e. compulsions) and high propensity for impulse buying, and "impulsive excessive buyers" lacking this high compulsivity and showing a lower but still strong tendency towards impulse purchases [32,33]. Associations between CB severity and co-morbidities has also been noted, with more severe CB associated with greater co-morbidity of Axis I disorders, particularly depressive and anxiety conditions [27,34], and hoarding behaviour [3,20,35-38], in both clinical samples and the general population. Similarly, compulsive buyers who score high on neuroticism but low on the other four major personality factors (extraversion, openness to

experience, agreeableness and conscientiousness), indicating more emotional dysregulation, have been found to have greater impulsivity, higher co-morbidity of depressive and anxiety conditions (including OCD), and lower remission rates, than those who score high on all five personality factors (including neuroticism), suggesting that the latter group may be more resilient [39].

Etiology

Biological, psychological and sociological factors have all been investigated for their possible contribution to risk for CB, and for indication of how best to classify CB.

From a biological perspective, disturbed activity of the serotonin, dopamine and/or opioid neurotransmitter systems has been proposed to influence vulnerability to CB [2]. Depletion of serotonin, which modulates mood, sense of well-being, the stress response and behavioural inhibition, has been implicated in the pathophysiology of disorders with compulsive and impulsive features, including OCD, eating disorders and addictive behaviours [8,40]. Elevation of dopamine, which mediates compulsivity, impulsivity, reward-motivated behaviour and behavioural conditioning through attentional bias, as well as craving and salience, has been implicated in the pathogenesis of ICDs, SUDs and behavioural addictions [41,42]. The gamma-aminobutyric acid (GABA) system, which is involved in behavioural inhibition, and the glutamatergic system, which is involved in both behaviour conditioning and inhibition [41], may also have roles to play. In addition, opioid neuropeptides, which enhance dopamine release and inhibit GABA in the brain, contribute to enhanced sense of well-being, excitement and pleasure, but also to dependence, and are thus also implicated in the pathophysiology of SUDs [43]. Medication classes that act on these systems have all been evaluated in CB, with positive results possibly suggesting common pathophysiological pathways that may link CB to specific categories of mental disorders.

Psychological hypotheses are mainly drawn from epidemiological data that reveal that CB is highly co-morbid with Axis I disorders, including depression, anxiety (including OCD), ICDs (such as kleptomania and intermittent explosive disorder), SUDs, and behavioural addictions (e.g. pathological gambling, eating disorders) [3,4,20,29,44], and that there is also high familial loading of depression, anxiety, SUDs and CB among compulsive buyers [4,44]. Personality disorders also tend to co-occur with CB, particularly the obsessive-compulsive, borderline, avoidant and narcissistic subtypes [20,39,45]. While these data also support a biological pathogenesis for CB, the possibility has also been raised that CB may be a compensatory behaviour for depression, anxiety or other negative mood states [1,2,7], and has led to evaluations of CB as a coping strategy. Related to this, some researchers have focused on the individual variance in factors that trigger buying episodes and the nature of items purchased, and have suggested that those with CB may fall into one of four categories: Those who buy to alleviate negative emotions and who deliberately select items that boost self-esteem (emotional reactive consumers); those who buy due to a spontaneous, impulsive urge, and for whom the nature of the item is almost irrelevant (impulsive consumers); those who are compulsively focused on purchasing specific items that have significant value to the individual ('fanatical' or compulsive consumers); and those who make a deliberate choice to buy attractive items as a means of relieving uncontrollable stress or anxiety (uncontrolled consumers) [10]. This framework attempts to offer a bridge between the classification of CB as an epiphenomenon of depression and as falling within the ICD, OCD or addictive spectrums, but currently has no published empirical data to support it.

Sociological research has noted that in order for CB to develop, certain societal features must also be present, such as a market-based economy that provides a wide range of buying opportunities, and spare income and time for individuals to be able to dedicate to buying; this makes CB highly unlikely to occur in poor countries, except among the rich elite, and indeed, to date, CB has only been reported in developed societies [18]. But even in these societies, additional factors appear essential for the presentation of this condition, at both a societal and personal level. Materialistic values, high accessibility of consumer goods (in stores, online, by phone) and easy access to credit have all been suggested as causes or facilitators of CB [7]. Indeed, the literature indicates that there are strong associations between these factors and CB.

The section below presents the literature in support of each of these theoretical frameworks.

Evidence for CB as a unique diagnosis in the OCD, ICD or addictive spectrums

Part of the challenge in classifying CB within one of the OCD, ICD and SUD/behavioural addictions spectrums is the considerable overlap in the general characteristics of these conditions, and the common features CB shares with each category. Favouring its conceptualization as an OCD spectrum condition is the difficulty buyers report in ignoring intrusive thoughts/urges about buying, and the increased anxiety they experience if they do not engage in buying behaviour, which are similar to features of OCD [17]. Others have pointed that in OCD, intrusive thoughts are constantly present and anxiety-reducing behaviours are experienced as burdensome, while in CB, buying urges and activity are usually impulsive and often occur sporadically, and buyers greatly enjoy the anticipation and process of buying; these features are more akin to the phenomenology of ICDs [16]. It has also been postulated that CB shares many of the characteristics of SUDs – irresistible urges; compulsive/impulsive, repetitive, uncontrolled behaviours; short-lived experience of excitement or pleasure; unsatisfying aftermath; resulting dysfunction in other life spheres – and thus, could be considered a behavioural (non-substance) addiction [1,46]. Withdrawal and tolerance symptoms and recovery without treatment for some, are also commonalities between CB and SUDs [3,4].

Some attempts to fit CB within one of these categories have focussed on assessing the presence of key traits of OCD, ICDs and SUDs in CB. Compulsive buyers have been found to score higher on impulsivity [47-50] and sensation-seeking [47,48] and lower on self-control [49] than controls, similar to findings both in ICDs such as kleptomania, and SUDs such as alcohol and nicotine addiction, which may account for the difficulty they experience with resisting the urge to buy [47]. In contrast, OCD patients score low on impulsivity [1]. However, CB may have both compulsive and impulsive aspects, similar to SUDs [1]; one study found divergent triggers for CB behaviour, with some respondents reporting a compulsive preoccupation with buying for some time prior to the act, while others endorsed an impulsive urge to buy that occurred in the moment [3]. CB also has other phenomenological features that resemble addiction – compulsive buyers often report experiencing high excitement or euphoria while buying [4], spending more time and money on buying than planned or can be afforded [4], and taking time away from other

life areas, including skipping important events, to buy items that are exclusive or may be in short supply [3]. Preliminary research also shows that compulsive buyers exhibit impairment of response inhibition, risk adjustment during decision making and spatial working memory compared to controls, similar to findings in SUDs and other behavioural addictions [51].

Other researchers seeking to classify CB have looked at its biological correlates, with some preliminary data emerging from genetic and neuroimaging studies. Disruptions of reward pathways (such as those of the serotonin and dopamine neurotransmitter systems) as a result of genetic deviations, are thought to lead to over-engagement with substances or behaviours that boost stimulation of the reward pathway [52]. One study found no association between serotonin 5-HTT gene polymorphisms and CB [53], though such polymorphisms have been noted in SUDs [46], as well as in depressive and anxiety conditions [53]. However, another study found that polymorphisms of the dopamine D1 receptor gene (DRD1) were associated with CB, as well as with a range of other addictive behaviours, such as smoking, alcohol use, gambling and compulsive eating [42]. Furthermore, the single available neuroimaging study in CB, which used a multi-phase purchasing task to assess brain activation during the gain/loss assessments and decision making associated with buying behaviour, found increased activation of the ventral striatum during product presentation (i.e. gain assessment phase), reduced activation of the insula and anterior cingulate cortex (ACC) during price presentation (i.e. loss assessment phase), and increased activation of the ACC during the decision to buy phase, in CB patients compared to controls [49]. These results are similar to those found in neuroimaging studies with SUDs, where there are similar alterations in activity of the ventral striatum and insula to response to substance/product cues and of the ACC during the risky decision making phase [46,49].

More classification indicators for CB are offered by results of medication trials (Table 1). Selective serotonin reuptake inhibitors (SSRIs), which have shown good efficacy primarily in OCD [40], but also to some degree in ICDs and SUDs/addictive disorders [41,54], have been most investigated in CB. An open trial of fluvoxamine in non-depressed CB subjects had positive results [55], but placebo-controlled randomized controlled trials (RCTs) (one with non-depressed subjects, the other with subjects with affective and addiction co-morbidities) were negative; however, the use of shopping logs (which may have led to increased self-monitoring and consequently, reduced buying) by both the fluvoxamine and placebo groups in the RCTs may have contributed to the high placebo response [56,57]. Similarly, in a discontinuation RCT in which almost half the subjects had co-morbid depression or anxiety, escitalopram showed significant benefits for both CB and co-morbid depression in the open label phase, but also failed to separate from placebo in the double-blind phase [58]. Citalopram has shown more consistent benefits in open trials [59,60] and a placebo-controlled RCT [60] for both acute treatment and relapse prevention, including in patients with CB and co-morbid depression, anxiety or ICDs. Mood stabilizers have sparse and mixed data in OCD [40], but have shown some utility for SUDs with or without co-morbid depression [61], as well as some benefits for ICDs and behavioural addictions [54]. However, they have only been evaluated to a limited extent in CB. One case series reported the benefit of antidepressants (usually SSRIs) combined with mood stabilizers for CB [4], but there is no published data with mood stabilizers as monotherapy. Opioid receptor antagonists, which have shown some efficacy in treating certain SUDs and behavioural addictions like pathological gambling [41], have shown positive results with naltrexone in case reports in CB subjects without co-morbidities [62,63]. Glutamatergic drugs have also shown preliminary benefits in open trials in pathological gambling [41], and improvement in impulsive buying and suppression of impulsive responses were noted with memantine in an open trial in CB subjects without co-morbidities [64]. The anticonvulsant, topiramate, which is a GABA-A agonist and glutamate antagonist that is also frequently used as a mood stabilizer, and which has shown good efficacy in treating alcohol dependence, as well as preliminary benefits for eating disorders [65,66], has been noted in two case reports to improve both CB and co-morbid depression, though there was much faster onset of improvement in CB symptoms [67,68].

Ref.	Study	Type	N	Duration	Treatment	Results*
Pharmacotherapy						
4	McElroy et al.	Case series	20 (95% with co-morbid depression, anxiety, ICDs, eating disorders) 65% medicated, 35% unmedicated	Unknown	Medicated patients: Antidepressants + mood stabilizers	Significant improvement in CB in 69% of medicated patients ($p<0.05$). No change in unmedicated patients
55	Black et al.	Open trial	10, non-depressed	9 weeks	Fluvoxamine	Significant improvement in CB ($p< 0.0001$)
56	Black et al.	RCT	23, non-depressed	9 weeks	Fluvoxamine vs. placebo	No group differences
57	Ninan et al.	RCT	42 (74% with co-morbid depression, anxiety, SUDs)	13 weeks	Fluvoxamine vs. placebo	No group differences
58	Koran et al.	RCT	26 (46% with co-morbid depression or anxiety)	Open label: 7 weeks Double-blind discontinuation: 9 weeks	Open label: Escitalopram Double-blind: Escitalopram vs. placebo	Open label: Significant improvement in CB and depression ($p<0.001$) Double-blind: No group differences in relapse rates
59	Koran et al.	Open trial	24 (96% with co-morbid depression, anxiety, ICDs)	12 weeks	Citalopram	Significant improvement in CB and depression ($p<0.001$). Gains maintained at 6-month follow-up

60	Koran et al.	RCT	24 (38% with co-morbid depression, anxiety, ICDs)	Open label: 7 weeks Double-blind discontinuation: 9 weeks	Open label: Citalopram Double-blind: Citalopram vs. placebo	Open label: Significant improvement in CB ($p<0.001$) and depression ($p<0.01$) Double-blind: Citalopram superior for preventing relapse in CB ($p<0.003$) and depression ($p<0.015$)
62	Grant	Case series	3, no current co-morbidity	9 months	Naltrexone	Significant improvement in CB ($p<0.05$)
63	Kim	Case series	15 (co-morbidities not reported)	9 months	Naltrexone	Significant improvement in CB ($p<0.05$)
64	Grant et al.	Open trial	9, no current co-morbidity	10 weeks	Memantine	Significant improvement in CB ($p<0.001$)
67	Guzman et al.	Case report	1 (with co-morbid depression)	3 months	Topiramate augmentation to venlafaxine	Significant improvement in CB and depression (p value not reported)
68	Ye et al.	Case report	1 (co-morbid with Bipolar II disorder, generalized anxiety, OCD and trichotillomania)	6 months	Topiramate augmentation to aripiprazole and lamotrigine	Significant improvement in CB, depression, OCD and trichotillomania (p value not reported).
Psychotherapy						
77	Mitchell et al.	RCT	39 (51% with co-morbid depression, anxiety, SUDs, eating disorders) Medication status not reported	10 weeks	CBT vs. wait-list	CBT superior in improving CB ($p<0.001$). Gains maintained at 6-month follow-up
78	Mueller et al.	RCT	60 (84% with co-morbid depression, anxiety, personality disorders) 48% on psychotropic agents	12 weeks	CBT vs. wait-list	CBT superior in improving CB ($p=0.002$). Gains maintained at 6-month follow-up
79	Muller et al.	RCT	56 (47% with co-morbid depression, anxiety, SUDs, eating disorders) Medication status not reported	10 weeks	CBT vs. telephone guided self-help (GSH) vs. wait-list	CBT superior for CB and depression ($p<0.05$), no differences between GSH and wait-list. Gains maintained at 6-month follow-up

*Statistically significant, $p<0.05$
CBT: Cognitive behavioural therapy; ICD: Impulse control disorder; OCD: Obsessive-compulsive disorder; SUD: Substance use disorder

Table 1: Treatment Studies in Compulsive Buying.

Overall, the preliminary results of phenomenological and neurobiological studies suggest that CB has much in common with SUDs and behavioural addictions. Available treatment trials further indicate that several neurotransmitter systems may be implicated in the pathophysiology of CB; the variability in trial outcomes also suggests that the pathophysiology of CB may differ for subgroups of patients, thus influencing their treatment response.

Evidence for CB as a coping strategy for negative mood states

The prominent co-morbidity between CB and depression [3,4,22,24,44,69,70] has led to the suggestion that CB may be a means by which some individuals cope with negative emotions, particularly depression [1,3,4,24,26,47]. Some patients report worsening of CB during depressive episodes, and lift in mood while buying [3,4]. Low self-esteem, which is common to both CB [8,19,49,71,72] and to depression [49], may mediate the relationship between depression and CB [7] – one study found greater depression and lower self-esteem among compulsive buyers than controls [49]. Interestingly, though links between depression and impulsivity have also been reported [49,73,74], no difference in impulsivity has been found between compulsive buyers with and without depression [29], perhaps due to the high impulsivity already inherent in CB. Further support for the notion that CB may be a coping strategy for depression in a subsection of patients comes from treatment data (as reviewed in the prior section). SSRIs and mood stabilizers are both proven treatments for depression [75], and while medications in these classes have shown efficacy in improving both CB and co-morbid depression in some studies [58,59,60,67,68], in others they only improved CB [4,57]. Similarly, cognitive behavioural therapy (CBT) has shown cross-benefits in depression, anxiety (including OCD), ICDs, SUDs and behavioural addictions [76]. It has also shown superiority to telephone-guided self-help and wait-list in RCTs for CB, in which half the participants had co-morbid affective and addictive disorders [77-79], but though it alleviated both CB and co-morbid depression in one study [79], it benefited only CB in the others [77,78] (Table 1). These results point to a shared pathophysiology between CB and

depression, at least in subgroups of patients. In addition, since other studies have noted the correlation between greater severity of CB and higher co-morbidity with depression [27,34], it suggests that for other subgroups, treatments targeted specifically at the depression may resolve compulsive buying symptoms, as well.

It has also been suggested CB may develop as an escape mechanism for individuals who find it difficult to tolerate any type of negative affect, and who cope by redirecting their focus to external stimuli [1]. Following from this, a recently developed cognitive-behavioural model of CB has proposed that it may result from a persistent failure in efforts at emotional self-regulation [80]. Indeed, compulsive buyers have been found to have poorer emotional self-regulation than controls [50] and to use maladaptive coping strategies like problem avoidance, wishful thinking and self-criticism [24]. Several studies in CB have found that a range of negative emotions (e.g. sadness, anxiety, anger, irritability, stress, boredom, self-criticism) directly precede buying activity, which is then positively reinforced by the lift in mood and increased pleasure experienced during the buying process [26,47,81], and negatively reinforced by the quick return of the inner tension or negative emotions that triggered the buying urge [26,31,81]. Indeed, greater severity of CB has been linked not only to higher psychiatric co-morbidity, but also to buying motivated by negative reinforcement, compared to less severe CB in which there is less co-morbid psychopathology and buying is motivated by positive reinforcement [33,35]. Emotional dysregulation appears to be key to the maintenance of CB, similar to its role in other compulsive-impulsive disorders like trichotillomania and binge eating [26,47], and offers another explanation for why compulsive buyers persist in engaging in behaviours that offer only momentary rewards and much longer-term negative consequences [50,81].

The available data thus offers some support for the development and maintenance of CB as a coping strategy for depression and emotional dysregulation, possibly facilitated by shared pathophysiological pathways, in subgroups of patients.

Evidence for CB as a sociological phenomenon

Consumer behaviour researchers have noted that CB has only been documented in developed countries, and have suggested that it is more a culture-bound epiphenomenon of the nature of these societies rather than a psychopathological condition [18]. They have pointed out that materialism (i.e. the belief that material possessions are highly desirable, and necessary to achieve happiness and success) and easy access to credit are intrinsic to such cultures, where material acquisition has become a means of expressing personal identity and self-image, of demonstrating or gaining social status, and of regulating mood and stress, and is an encouraged part of personal and lifestyle goals [18,19,82]. This creates a social environment in which constant purchase of goods (usually on credit and even when one cannot afford them) becomes an accepted, and even encouraged, social activity.

Supporting the notion that socialization plays a role in the development of CB, studies have found that materialism is both strongly correlated with CB [19,70,83], and also predicts CB [70,84]. There is also documented increase in CB in societies that move from a minimalist/low resource culture to a materialistic/high resource culture [23,85]. Similarly, economic downturns at a societal level, and societal shifts towards less spending, have been found to reduce compulsive buying tendencies even if the individuals, themselves, are not in current financial difficulties [86]. In addition, positive attitudes of parents, and particularly peers, towards materialism and excessive buying [87] and greater family affluence [85,88] have been associated with greater materialism and higher likelihood of CB among youth, suggesting that in-group modelling of attitudes towards money and material goods may facilitate the early onset associated with CB [87,88]. Also of note, availability of credit and money management attitudes and practices (i.e. those related to saving, spending, borrowing and using credit), have been linked to both materialism and CB [83]. Incidence of CB has been found to be mediated by availability of easy credit [71,89,90], while poor money management has been found to predict CB [91] and to mediate the relationship between materialism and CB [83,91].

The strong influence of materialism on individual self-image and lifestyle goals also contributes to CB [18,19,82]. Poor self-image (i.e. low self-esteem) has been linked to both stronger materialistic values [19,87] and to CB [19,49,71]. Compulsive buyers report that purchased items are usually chosen to boost their self-image and others' perception of them [4,20] – it is thus unsurprising that these items tend to be culturally-endorsed status symbols [2,3,20]. CB has also correlated positively with feeling pressure to keep up financially with peers [71,89,90]. Furthermore, developed countries have historical documentation of increases in credit card debt and CB during economic downturns, primarily among the lower and middle classes (who experience proportionally greater impact on their buying power and standard of living during such times than the upper class), which has been attributed to their need to achieve or maintain self-image and lifestyle ideals despite economic constraints [18].

Thus, the values and privileges of developed societies, as reflected in materialism and access to credit funds, appear to make pivotal contributions to the onset and maintenance of CB.

Discussion

The main objective of this review was to evaluate the published literature for indicators of how best to classify CB. Though the body of literature on CB is still small, available data suggest that in many aspects of clinical, pharmacotherapeutic and biological data, CB is more similar to SUDs than to OCD or ICDs, and is better conceptualized as a behavioural addiction. Similarities between CB and other behavioural addictions further support its conceptualization as a behavioural addiction. The high co-morbidity of CB and other compulsive-impulsive conditions, such as eating disorders, kleptomania and pathological gambling (PG), has already been noted [3,4,20,92]. Preliminary findings from neuroimaging and genetic data also reveal commonalities in brain activity, neurotransmitter involvement and genetics between SUDs and CB, PG and kleptomania, as well as compulsive internet use, compulsive video game playing, and sex addiction, further supporting the categorization of these non-SUD disorders as behavioural addictions [46]. These latter disorders also share several other phenomenological features with CB and SUDs: Early onset in adolescence and young adulthood; irresistible urges or cravings; compulsive engagement in specific behaviours; positive reinforcement of immediate, though transitory, gratification (despite the longer-term negative consequences); and negative reinforcement through alleviation of negative emotion and/or distraction from negative events or situations, pointing to maladaptive coping and emotional dysregulation as key psychological factors in the etiology of these disorders [46]. As well, like CB, the range of biopsychosocial contributors to these other disorders is wide, leading to a heterogeneous patient population, and clinical diagnosis is further complicated by the fact that many of these behaviours (e.g. shopping,

gambling, sex, internet and video game use) are normal, context-driven phenomena (e.g. several hours a day of video game playing may be essential for game developers, testers or reviewers), which may make it difficult to distinguish between acceptable and abnormal levels of these behaviours in clinical presentation [93]. Together, these data suggest a shared pathophysiological pathway and psychosocial etiology between CB and these disorders that would be highly useful to investigate further, to add to our understanding of CB and our ability to treat it effectively, and to inform prevention strategies.

PG may be of particular interest for evaluations against CB, since, similar to CB, it was formerly listed under ICDs not otherwise specified (in the DSM-IV-TR [94]). It is now categorized in the DSM-5 under Substance-related and Addictive Disorders [15]. PG differs from CB in that more males are diagnosed and treated for PG than females and onset of illness is in the late 20s to early 30s (later than for CB) [16]. However, they also share several commonalities, such as co-morbidity with each other and with Axis I and Cluster B personality disorders; episodic or chronic course that may remit spontaneously; repetitive and ego-syntonic behaviours driven by irresistible urges and followed by shame, guilt and adverse financial and psychosocial effects; monoaminergic dysfunction; and an inconsistent response to medication, but promising results with CBT [16,95]. It has been suggested that CB and PG may be gender-specific expressions of the same core impulsive tendencies [16]. Thus, it could be argued that, given these similarities, CB might join PG in the Substance-related and Addictive Disorders category at a future point.

The published data also clearly indicate that biological vulnerability (e.g. genetic/familial loading), psychological motivators (e.g. negative mood, emotional dysregulation) and sociological impetuses (e.g. materialism, easy access to credit) have an interactive influence on the onset and maintenance of CB. This contributes to heterogeneous patient subgroups with variable pathophysiology and psychosocial etiology that may require individually tailored treatment plans. Effective treatment will therefore need to utilize a biopsychosocial approach, such as a combination of pharmacotherapy and psychotherapy. Some consumer researchers have pointed out that a good percentage of compulsive buyers lack psychiatric co-morbidity and engage in excessive buying due to poor self-image, and may otherwise have fairly normal and successful lives [96], suggesting that psychosocial interventions may be more useful than pharmacotherapy. However, it can also be argued that other culturally bound conditions, like eating disorders, still benefit from the combination of pharmacotherapy and psychotherapy, and similarly, alcohol and drug abuse, which frequently start as coping strategies for difficult life circumstances, quickly become addictions that require both pharmacological and psychosocial intervention. Medication choices for CB may be guided by the presence of co-morbid diagnoses, for example, SSRIs when depression or anxiety are present, or glutamatergic treatment when impulsivity and lack of self-control are clinical issues [64]. Among psychotherapies, CBT for CB addresses both psychological and sociological influences, targeting not only cognitive restructuring, emotional regulation, behavioural modification and development of adaptive coping skills, but also self-esteem, materialistic values and money management [78,79]. Self-help modalities, such as support groups (e.g. Debtors Anonymous, 'simple lifestyle' promotion) and self-help guides, and financial education to assist with money management, may also have some utility as part of treatment [2,7].

Some caveats must be noted. The conclusions and recommendations above are based on the relatively small literature on CB, in which many gaps in knowledge remain. The etiological basis of CB remains mostly speculative and available data is often inconsistent. More data from larger studies could help to delineate the strongest influences on the development of CB (biological, psychological and/or sociocultural) for the benefit of better treatment strategies [7], and could possibly lead to a different categorization of CB than as the behavioural addiction suggested in this review. Longitudinal and epidemiological studies are also few and frequently some years old. Better understanding of the course of CB over the lifespan, such as fluctuations in severity, secondary peaks of onset, etc., could be particularly useful for treatment planning, given its early onset [2,46]. More national, cross-cultural epidemiological data could also help to substantiate or refute the gender differences observed in clinical studies [2]. It is also of note that biological/psychological data for CB was derived from clinically diagnosed patient samples while sociological data was derived from undiagnosed undergraduate student populations; thus, the results of one group may not be generalizable to the other, highlighting the need for biopsychosocial-oriented research in both clinical and non-clinical samples to provide a true picture of its prevalence, course and correlates, and to help develop wide-reaching interventions. As well, some literature distinguishes between forms of excessive buying, with the compulsive form described as motivated by compulsive urges that build over a period and a desire to avoid negative emotions, and the impulsive form defined as driven by spontaneous, in the moment impulses and frequently positive emotions [3,10,32,33,97]. However, the majority of the literature tends to evaluate CB as a singular concept, with little attention paid to the triggers for the behavior. Due to potential impacts of this gap in research on both understanding and treatment planning for CB, further investigation is encouraged.

Diagnosis of CB in clinical research generally involves the use of the McElroy et al. [4] criteria, and while several other similar definitions of CB are available in the literature, none of their reliabilities and validities have been formally determined [2]. This gap in the literature is significant because it may have contributed to the difficulty in categorizing CB among the domains of compulsive-impulsive psychiatric disorders, given the overlap in characteristics among OCD, ICDs and SUD/behavioural addictions. Research to establish the reliability and validity of diagnostic criteria for CB may provide much needed support for its conceptualization as a distinct psychiatric condition, among compulsive-impulsive disorders. It is also of note that the range of measures developed to assess CB symptoms, such as the CBS [8] and ECBS [11], among others, are frequently perceived as interchangeable in sensitivity and validity. However, a recent comparison of three of these scales (the ECBS, QABB and RCBS) found significant variation in lifetime prevalence rates of CB within the same population sample, depending on the scale used [98]. This was attributed to differences in structure and content of the scales, which in turn led to disparities in the CB populations they identified [98]. It raises the question of how accurately individuals with CB have been identified in both research and clinical practice thus far, or will be in future, based on the assessment scale employed, which has important implications for delineation of the problem at individual and societal levels, and could affect direction and funding of treatment. More research that compares available CB scales, and identifies the best assessment scales to guide patient care and health resource utilization, would be valuable.

Treatment of CB also has sparse data, and would benefit from more investigations of the efficacy of both medications and CBT, and particularly their combination (which has not yet been formally evaluated), for both acute and maintenance treatment [7]. More evidence on the impact of co-morbid conditions on CB severity and treatment response would also support better treatment planning [7]. In addition, research to confirm if there are indeed patient subtypes (as variation in medication data suggest), and to determine if these subtypes are more likely to respond to specific treatments, is also lacking and would be helpful [2]. Elucidation of the relationship of CB to the other disorders with which it often co-occurs (e.g. depression, anxiety, SUDs) to determine whether it precedes those conditions or follows them, and whether it occurs independently of other disorders or is merely an epiphenomenon of other primary diagnoses [2], may also assist in specifying subtypes. Additional genetic and neuroimaging investigations comparing data in CB to that in depression, SUDs, and other conditions with compulsive-impulsive features could also help to test the subtype hypothesis, and could also provide direction on appropriate treatment strategies [2]. Since the debate on the classification of CB is a continuing one, neurobiological studies could also aid in further delineating similarities and differences between CB and OCD, ICDs and SUDs [46]. As well, research with participants with both CB and SUDs could greatly enrich our knowledge of the pathophysiology of addictions and support the development of innovative treatment strategies [46].

The published literature on CB has many gaps that would benefit from additional research (as described above), but it has also revealed some challenging aspects of the social context of CB that may counter treatment benefits and facilitate relapse. For one, it is perhaps controversial, but probably accurate, to state that in many ways, developed societies encourage incidence of CB [18]. Entertainment media often portray 'retail therapy' as a quick and easy way to lift mood or as a comedic device (e.g. in the popular novel series, Confessions of a Shopaholic, and the award-winning TV series, Sex and the City); in other words, excessive buying is presented as both innocuous and fashionable, a casual way of highlighting the desirable style and lifestyle of central media figures [82]. In addition, product placements on television shows and in film, heavy advertising of ever-changing consumer goods, idealization of celebrity lifestyles, and the now ubiquitous social convention of buying on credit, all promote conspicuous consumption and overspending with societal approval [18]. Furthermore, during economic downturns, governments often encourage the public to spend money to support the economy, and almost portray it as a civic act. Indeed, CB has sometimes been described as a 'socially acceptable addiction' [82]. Unlike with substance addictions (but perhaps similar to behavioural addictions like pathological gambling), buying opportunities are widely available in traditional stores, by phone or by internet [7]. Unfortunately, promotion of fiscal responsibility and education on pre-planning purchases or delayed rather than immediate gratification, is far less common in popular media [18]. Resisting the almost constant buying encouragement from society and social media, and the numerous buying opportunities encountered on a daily basis, will be a long-term challenge for compulsive buyers, and may contribute to relapse in many.

As a 'socially acceptable addiction", CB is highly attractive to youth, and another controversy is that its incidence among youth may be facilitated by the collaboration of reputable social institutions, such as financial and academic organizations, in turning young adults into a new consumer generation [82,89]. Banks and credit card companies commonly target postsecondary students as potential new clients, offering pre-approved access to credit and rewards for credit card applications despite students' usually very low incomes, and encouraging card usage as a way of building credit history [82]. First contact between financial institutions and postsecondary students is often coordinated with academic centres, through booths set up at orientation sessions, solicitations distributed by student organizations, or mail-outs using student lists provided by the centres, and may even include offers of affinity cards (a credit card with the academic centre's name and logo) which are highly attractive to students [89]. As postsecondary students are in a period of life transition that usually coincides with experience of greater personal and financial freedom (e.g. less parental oversight, first jobs, more control over personal time and finances), but also greater stress and vulnerability to peer pressure, the habit of overspending is easily acquired, and it is perhaps unsurprising that age of onset of CB is in this life phase [2,90]. Indeed, incidence of CB among postsecondary students has been found to be mediated by availability of easy credit [71,89,90]. However, financial institutions do not provide financial education with the card, and students' access to credit continues as long as minimum interest charges are paid on outstanding balances [82]. This only encourages further overspending. It is also of note that postsecondary institutions also profit from credit links to financial institutions, via receipt of booth fees and percentages of charges on affinity cards, and by allowing students to use credit cards to pay for tuition and other fees, and thus could be said to benefit from student debt [89]. In addition, while financial counselling may be available on campus for students with credit difficulties, few pre-emptive financial education programs are provided [89]. But such easy access to credit can have tragic consequences for students, as high credit card debt has been linked not only to postsecondary drop-out (even more so than due to academic failure), but also to high rates of student suicide [89]. To protect this vulnerable population from onset of CB, it has been argued that financial companies should be mandated to provide financial education to young adult clients as a social responsibility [90], and that financial education should also be incorporated into regular academic curricula [89,90]. Limiting student access to credit, and re-evaluating policies regarding joint collaborations as they relate to student credit is also recommended, but these options may be unattractive to postsecondary and financial institutions due to the monetary implications [89].

Conclusions

In summary, the limited data on CB offers more support for its classification as a behavioural addiction than as part of the OCD or ICD spectrums. The data also indicate that a range of biological, psychological and sociocultural factors combine to influence the presentation of CB, resulting in a heterogeneous patient population with subgroups that differ in pathophysiology and psychosocial etiology, and likely also treatment response. Integrated treatment plans will be needed for sustainable results, but their long-term efficacy, and that of initiatives to prevent CB, may be challenged by existing societal values and practices. Further research, through large, cross-cultural longitudinal and epidemiological studies, and additional investigations of biopsychosocial influences and treatments, is encouraged to enhance our ability to understand and address this condition.

Funding disclosure

This manuscript was prepared independently, with no funding support from any source.

Conflict of Interest

The author has no conflicts of interest to report.

References

1. Lejoyeux M, Weinstein A (2010) Compulsive buying. Am J Drug Alcohol Abuse 36: 248-253.
2. Black DW (2007) Compulsive buying disorder: a review of the evidence. CNS Spectr 12: 124-132.
3. Christenson GA, Faber RJ, de Zwaan M, Raymond NC, Specker SM, et al. (1994) Compulsive buying: descriptive characteristics and psychiatric comorbidity. J Clin Psychiatry 55: 5-11.
4. McElroy SL, Keck PE Jr, Pope HG Jr, Smith JM, Strakowski SM (1994) Compulsive buying: a report of 20 cases. Journal of Clinical Psychiatry 55: 242-248.
5. Kraepelin E (1915) Psychiatrie (8th edtn) Leipzig, Germany: Verlag Von Johann Ambrosius Barth, 408-409.
6. Bleuler E (1924) Textbook of Psychiatry. New York, NY: Macmillan; pp. 538-540.
7. Dell'Osso B, Allen A, Altamura AC, Buoli M, Hollander E (2008) Impulsive-compulsive buying disorder: clinical overview. Aust N Z J Psychiatry 42: 259-266.
8. Faber RJ, O'Guinn TC (1992) A clinical screener for compulsive buying. J Consum Res 19:459-469.
9. Monahan P, Black DW, Gabel J (1996) Reliability and validity of a scale to measure change in persons with compulsive buying. Psychiatry Res 64: 59-67.
10. Valence G, d'Astous A, Fortier L (1988) Compulsive buying: concept and measurement. J Consum Policy 11: 419-433.
11. Edwards EA (1993) Development of a new scale to measure compulsive buying behavior. Financial Counseling and Planning 4: 67-84.
12. Lejoyeux M, Tassain V, Solomon J, Adès J (1997) Study of compulsive buying in depressed patients. J Clin Psychiatry 58: 169-173.
13. Ridgway NM, Kukar-Kinney M, Monroe KB (2008) An expanded conceptualization and a new measure of compulsive buying. Journal of Consumer Research 35: 622-639.
14. American Psychiatric Association (1987) Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, Revised (DSM-III-TR). Washington, DC: American Psychiatric Association.
15. American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5. Arlington, VA: American Psychiatric Publishing.
16. Black DW, Shaw M, Blum N (2010) Pathological gambling and compulsive buying: do they fall within an obsessive-compulsive spectrum? Dialogues Clin Neurosci 12: 175-185.
17. Fontenelle LF, Oostermeijer S, Harrison BJ, Pantelis C, Yücel M (2011) Obsessive-compulsive disorder, impulse control disorders and drug addiction: common features and potential treatments. Drugs 71: 827-840.
18. Lee S1, Mysyk A (2004) The medicalization of compulsive buying. Soc Sci Med 58: 1709-1718.
19. Reeves RA, Baker GA, Truluck CS (2012) Celebrity worship, materialism, compulsive buying, and the empty self. Psychol Marketing 29:674-679.
20. Schlosser S, Black DW, Repertinger S, Freet D (1994) Compulsive buying. Demography, phenomenology, and comorbidity in 46 subjects. Gen Hosp Psychiatry 16: 205-212.
21. Koran LM, Faber RJ, Aboujaoude E, Large MD, Serpe RT (2006) Estimated prevalence of compulsive buying behavior in the United States. Am J Psychiatry 163: 1806-1812.
22. Mueller A, Mitchell JE, Crosby RD, Gefeller O, Faber RJ, et al. (2010) Estimated prevalence of compulsive buying in Germany and its association with sociodemographic characteristics and depressive symptoms. Psychiatry Res 180: 137-142.
23. Neuner M, Raab G, Reisch LA (2005) Compulsive buying in maturing societies: an empirical re-inquiry. J Economic Psychol 26: 509-522.
24. Otero-López JM, Villardefrancos E (2014) Prevalence, sociodemographic factors, psychological distress, and coping strategies related to compulsive buying: a cross sectional study in Galicia, Spain. BMC Psychiatry 14: 101.
25. Dittmar H (2004) Understanding and diagnosing compulsive buying. In: Coombs RH, Addictive Disorders: A Practical Handbook. New York: Wiley: 411-450.
26. Miltenberger RG, Redlin J, Crosby R, Stickney M, Mitchell J, et al. (2003) Direct and retrospective assessment of factors contributing to compulsive buying. J Behav Ther Exp Psychiatry 34: 1-9.
27. Black DW, Monahan P, Schlosser S, Repertinger S (2001) Compulsive buying severity: an analysis of Compulsive Buying Scale results in 44 subjects. J Nerv Ment Dis 189: 123-126.
28. Nataraajan R, Goff BG (1992) Manifestations of compulsiveness in the consumer-marketplace domain. Psychol Marketing 9: 31-44.
29. Lejoyeux M, Haberman N, Solomon J, Adès J (1999) Comparison of buying behavior in depressed patients presenting with or without compulsive buying. Compr Psychiatry 40: 51-56.
30. Rook DW (1987) The buying impulse. J Consum Res 14:189-199.
31. Lejoyeux M, Adès J, Tassain V, Solomon J (1996) Phenomenology and psychopathology of uncontrolled buying. Am J Psychiatry 153: 1524-1529.
32. DeSarbo WS, Edwards EA (1996) Typologies of compulsive buying behavior: A constrained clusterwise regression approach. J Consum Psychol 5: 231-262.
33. Yi S (2013) Heterogeneity of compulsive buyers based on impulsivity and compulsivity dimensions: a latent profile analytic approach. Psychiatry Res 208: 174-182.
34. Mueller A, Mitchell JE, Black DW, Crosby RD, Berg K, et al. (2010) Latent profile analysis and comorbidity in a sample of individuals with compulsive buying disorder. Psychiatry Res 178: 348-353.
35. Lawrence LM, Ciorciari J, Kyrios M (2014) Relationships that compulsive buying has with addiction, obsessive-compulsiveness, hoarding, and depression. Compr Psychiatry 55: 1137-1145.

36. Möllenkamp M, de Zwaan M, Müller A (2015) Hoarding with and without excessive buying: results of a pilot study. Psychopathology 48: 56-59.
37. Mueller A, Mitchell JE, Crosby RD, Glaesmer H, de Zwaan M (2009) The prevalence of compulsive hoarding and its association with compulsive buying in a German population-based sample. Behav Res Ther 47: 705-709.
38. Mueller A, Mueller U, Albert P, Mertens C, Silbermann A, et al. (2007) Hoarding in a compulsive buying sample. Behav Res Ther 45: 2754-2763.
39. Mueller A, Claes L, Mitchell JE, Wonderlich SA, Crosby RD, et al. (2010) Personality prototypes in individuals with compulsive buying based on the Big Five Model. Behav Res Ther 48: 930-935.
40. Fineberg NA, Reghunandanan S, Brown A, Pampaloni I (2013) Pharmacotherapy of obsessive-compulsive disorder: evidence-based treatment and beyond. Aust N Z J Psychiatry 47: 121-141.
41. van den Brink W (2012) Evidence-based pharmacological treatment of substance use disorders and pathological gambling. Curr Drug Abuse Rev 5: 3-31.
42. Comings DE, Gade R, Wu S, Chiu C, Dietz G, et al. (1997) Studies of the potential role of the dopamine D1 receptor gene in addictive behaviors. Mol Psychiatry 2: 44-56.
43. Sadée W, Wang D, Bilsky EJ (2005) Basal opioid receptor activity, neutral antagonists, and therapeutic opportunities. Life Sci 76: 1427-1437.
44. Black DW, Repertinger S, Gaffney GR, Gabel J (1998) Family history and psychiatric comorbidity in persons with compulsive buying: preliminary findings. Am J Psychiatry 155: 960-963.
45. Sansone RA, Chang J, Jewell B, Sellborn M, Bidwell M (2013) Compulsive buying and borderline personality symptomatology. Journal of Personality Disorders 27: 260-268.
46. Leeman RF, Potenza MN (2013) A targeted review of the neurobiology and genetics of behavioural addictions: an emerging area of research. Can J Psychiatry 58: 260-273.
47. Billieux J, Rochat L, My Lien Rebetz M, Van Der Linden M (2008) Are all facets of impulsivity related to self-reported compulsive buying behavior? Personality and Individual Differences 44: 1432–1442.
48. Black DW, Shaw M, McCormick B, Bayless JD, Allen J (2012) Neuropsychological performance, impulsivity, ADHD symptoms, and novelty seeking in compulsive buying disorder. Psychiatry Res 200: 581-587.
49. Raab G, Elger C, Neuner M, Weber B (2011) A neurological study of compulsive buying behaviour. J Consum Policy 34: 401–413.
50. Williams AD, Grisham JR (2012) Impulsivity, emotion regulation, and mindful attentional focus in compulsive buying. Cognitive Ther Res 36: 451-457.
51. Derbyshire KL, Chamberlain SR, Odlaug BL, Schreiber LR, Grant JE (2014) Neurocognitive functioning in compulsive buying disorder. Ann Clin Psychiatry 26: 57-63.
52. Comings DE, Blum K (2000) Reward deficiency syndrome: genetic aspects of behavioral disorders. Prog Brain Res 126: 325-341.
53. Devor EJ, Magee HJ, Dill-Devor RM, Gabel J, Black DW (1999) Serotonin transporter gene (5-HTT) polymorphisms and compulsive buying. Am J Med Genet 88: 123-125.
54. Schreiber L, Odlaug BL, Grant JE (2011) Impulse control disorders: updated review of clinical characteristics and pharmacological management. Front Psychiatry 2: 1.
55. Black DW, Monahan P, Gabel J (1997) Fluvoxamine in the treatment of compulsive buying. J Clin Psychiatry 58: 159-163.
56. Black DW, Gabel J, Hansen J, Schlosser S (2000) A double-blind comparison of fluvoxamine versus placebo in the treatment of compulsive buying disorder. Ann Clin Psychiatry 12: 205-211.
57. Ninan PT, McElroy SL, Kane CP, Knight BT, Casuto LS, et al. (2000) Placebo-controlled study of fluvoxamine in the treatment of patients with compulsive buying. J Clin Psychopharmacol 20: 362-366.
58. Koran LM, Aboujaoude EN, Solvason B, Gamel NN, Smith EH (2007) Escitalopram for compulsive buying disorder: a double-blind discontinuation study. J Clin Psychopharmacol 27: 225-227.
59. Koran LM, Bullock KD, Hartston HJ, Elliott MA, D'Andrea V (2002) Citalopram treatment of compulsive shopping: an open-label study. J Clin Psychiatry 63: 704-708.
60. Koran LM, Chuong HW, Bullock KD, Smith SC (2003) Citalopram for compulsive shopping disorder: an open-label study followed by double-blind discontinuation. J Clin Psychiatry 64: 793-798.
61. Maremmani I, Pacini M, Lamanna F, Pani PP, Perugi G, et al. (2010) Mood stabilizers in the treatment of substance use disorders. CNS Spectr 15: 95-109.
62. Grant JE (2003) Three cases of compulsive buying treated with naltrexone. International J Psych Clin Prac 7:223-225.
63. Kim SW (1998) Opioid antagonists in the treatment of impulse-control disorders. J Clin Psychiatry 59: 159-164.
64. Grant JE, Odlaug BL, Mooney M, O'Brien R, Kim SW (2012) Open-label pilot study of memantine in the treatment of compulsive buying. Ann Clin Psychiatry 24: 119-126.
65. Arnone D (2005) Review of the use of Topiramate for treatment of psychiatric disorders. Ann Gen Psychiatry 4: 5.
66. Shinn AK, Greenfield SF (2010) Topiramate in the treatment of substance-related disorders: a critical review of the literature. J Clin Psychiatry 71: 634-648.
67. Guzman CS, Filomensky T, Tavares H (2007) Compulsive buying treatment with topiramate, a case report. Rev Bras Psiquiatr 29: 383-384.
68. Ye L, Kadia S, Lippmann S (2014) Topiramate and compulsive buying disorder. J Clin Psychopharmacol 34: 174-175.
69. Mueller A, Mitchell JE, Mertens C, Mueller U, Silbermann A, et al. (2007) Comparison of treatment seeking compulsive buyers in Germany and the United States. Behav Res Ther 45: 1629-1638.
70. Mueller A, Mitchell JE, Peterson LA, Faber RJ, Steffen KJ, et al. (2011) Depression, materialism, and excessive Internet use in relation to compulsive buying. Compr Psychiatry 52: 420-424.
71. Roberts JA (1998) Compulsive buying among college students: An investigation of its antedecents, consequences, and implications for public policy. J Consum Aff 32: 295–319.
72. Scherhorn G, Reisch LA, Raab G (1990) Addictive buying in West Germany: An empirical study. J Consum Policy 13: 355-388.
73. Patton JH, Stanford MS, Barratt ES (1995) Factor structure of the Barratt impulsiveness scale. J Clin Psychol 51: 768-774.

74. Peluso MA, Hatch JP, Glahn DC, Monkul ES, Sanches M, et al. (2007) Trait impulsivity in patients with mood disorders. J Affect Disord 100: 227-231.
75. Lam RW, Kennedy SH, Grigoriadis S, McIntyre RS, Milev R, et al. (2009) Canadian Network for Mood and Anxiety Treatments (CANMAT) clinical guidelines for the management of major depressive disorder in adults. III. Pharmacotherapy. J Affect Disord 117 Suppl 1: S26-43.
76. Hofmann SG, Asnaani A, Vonk IJ, Sawyer AT, Fang A (2012) The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. Cognit Ther Res 36: 427-440.
77. Mitchell JE, Burgard M, Faber R, Crosby RD, de Zwaan M (2006) Cognitive behavioral therapy for compulsive buying disorder. Behav Res Ther 44: 1859-1865.
78. Mueller A, Mueller U, Silbermann A, Reinecker H, Bleich S, et al. (2008) A randomized, controlled trial of group cognitive-behavioral therapy for compulsive buying disorder: Posttreatment and 6-month followup results. J Clin Psychiatry 69: 1131-1138.
79. Müller A, Arikian A, de Zwaan M, Mitchell JE (2013) Cognitive-behavioural group therapy versus guided self-help for compulsive buying disorder: a preliminary study. Clin Psychol Psychother 20: 28-35.
80. Kellett S, Bolton JV (2009) Compulsive buying: a cognitive-behavioural model. Clin Psychol Psychother 16: 83-99.
81. Müller A, Mitchell JE, Crosby RD, Cao L, Johnson J, et al. (2012) Mood states preceding and following compulsive buying episodes: an ecological momentary assessment study. Psychiatry Res 200: 575-580.
82. Kearney M, Stevens L (2012) Compulsive buying: Literature review and suggestions for future research. Market Rev 12: 233-251.
83. Donnelly G, Ksendzova M, Howell RT (2013) Sadness, identity and plastic in over-shopping: The interplay of materialism, poor credit management, and emotional buying motives in predicting compulsive buying. J Economic Psychol 39: 113-125.
84. Dittmar H (2005) Compulsive buying--a growing concern? An examination of gender, age, and endorsement of materialistic values as predictors. Br J Psychol 96: 467-491.
85. Khare A (2013) Credit card use and compulsive buying behavior. J Global Marketing 26: 28-40.
86. Unger A, Papastamatelou J, Yolbulan Okan E, Aytas S (2014) How the economic situation moderates the influence of available money on compulsive buying of students - A comparative study between Turkey and Greece. J Behav Addict 3: 173-181.
87. Roberts JA, Manolis C, Tanner JF Jr (2008) Interpersonal influence and adolescent materialism and compulsive buying. Social Influence 3: 114-131.
88. Baker AM, Moschis GP, Benmoyal-Bouzaglo S, Pizzutti dos Santos C (2013) How family resources affect materialism and compulsive buying: a cross-country life course perspective. Cross-cultural Res 47: 335-362.
89. Roberts JA, Jones E (2001) Money attitudes, credit card use, and compulsive buying among American college students. J Consum Aff 35: 213-240.
90. Wang J, Xiao JJ (2009) Buying behavior, social support and credit card indebtedness of college students. Int J Consum Studies 33: 2-10.
91. Pham TH, Yap K, Dowling NA (2012) The impact of financial management practices and financial attitudes on the relationship between materialism and compulsive buying. J Economic Psychol 33: 461-470.
92. Faber RJ, Christenson GA, De Zwaan M, Mitchell J (1995) Two forms of compulsive consumption: comorbidity of compulsive buying and binge eating. J Consum Res 22: 296-394.
93. Karim R, Chaudhri P (2012) Behavioral addictions: an overview. J Psychoactive Drugs 44: 5-17.
94. American Psychiatric Association (2000) Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Revised (DSM-IV-TR). Washington, DC: American Psychiatric Association.
95. Jiménez-Murcia S, Granero R, Moragas L, Steiger H, Israel M, et al. (2014) Differences and Similarities Between Bulimia Nervosa, Compulsive Buying and Gambling Disorder. Eur Eat Disord Rev 23: 111-118.
96. Dittmar H, Drury J (2000) Self-image—Is it in the bag? A qualitative comparison between ordinary and excessive consumers. J Economic Psychol 21: 109-142.
97. Rose P, Segrist DJ (2014) Negative and positive urgency may both be risk factors for compulsive buying. J Behav Addict 3: 128-132.
98. Maraz A, Eisinger A, Hende B, Urbán R, Paksi B, et al. (2015) Measuring compulsive buying behaviour: psychometric validity of three different scales and prevalence in the general population and in shopping centres. Psychiatry Res 225: 326-334.