



# Problematic Online Buying-Shopping: Is it Time to Considering the Concept of an Online Subtype of Compulsive Buying-Shopping Disorder or a Specific Internet-Use Disorder?

Astrid Müller<sup>1</sup> · Nora M. Laskowski<sup>1,2</sup> · Elisa Wegmann<sup>3</sup> · Sabine Steins-Loeber<sup>4</sup> · Matthias Brand<sup>3,5</sup>

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## Abstract

**Purpose of Review** Problematic online buying-shopping became a recent research topic, and the question arises as to whether it would be useful to differentiate between a “predominantly online” and a “predominantly offline” compulsive buying-shopping disorder (CBSD) subtype by analogy with gaming disorder and gambling disorder in the ICD-11. This narrative review aims at reflecting the discussions on overlaps of problematic online buying-shopping with both offline CBSD and specific internet-use disorders.

**Recent Findings** Preliminary data suggest that problematic online buying-shopping shares many commonalities with both offline CBSD and potential specific internet-use disorders (e.g., gaming disorder, pornography-use disorder, or social-network–use disorder). However, there is a lack of research addressing the etiology, underlying affective and cognitive mechanisms, psychosocial correlates, comorbidity profiles, and treatment of problematic online buying-shopping.

**Summary** The question of whether online CBSD can develop independently from offline CBSD or only as medial transformation of offline CBSD still remains unanswered due to limited research on problematic online buying-shopping. Both perspectives are conceivable: that online CBSD represents a standalone specific internet-use disorder or the online subtype of CBSD. Future studies should examine which approach has clinical utility and indicates specific treatment options and better outcomes.

**Keywords** Compulsive buying-shopping disorder · Pathological buying · Online shopping addiction · Internet-use disorder

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This article is part of the Topical Collection on *Internet Use Disorders*

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✉ Astrid Müller  
mueller.astrid@mh-hannover.de

<sup>1</sup> Department of Psychosomatic Medicine and Psychotherapy, Hannover Medical School, Carl-Neuberg-Str. 1, 30265 Hannover, Germany

<sup>2</sup> Department of Clinical Psychology, Psychotherapy and Diagnostics, Technische Universität Braunschweig, Braunschweig, Germany

<sup>3</sup> General Psychology: Cognition and Center for Behavioral Addiction Research (CeBAR), University of Duisburg-Essen, Duisburg, Germany

<sup>4</sup> Department of Clinical Psychology and Psychotherapy, Otto Friedrich University of Bamberg, Bamberg, Germany

<sup>5</sup> Erwin L. Hahn Institute for Magnetic Resonance Imaging, Essen, Germany

## Introduction

Clinical interest in the phenomenon of excessive, maladaptive consumption of consumer goods emerged already in the early twentieth century [1]. Since then, research efforts have gradually increased to investigate the phenomenology, assessment, prevalence, psychosocial correlates, neuropsychology, and treatment of this mental health condition [2–6, 7•]. Although compulsive buying-shopping disorder (CBSD) is not listed as a separate mental disorder in the ICD-11, it is now mentioned as an example of the “other specified impulse control disorders (6C7Y)” category [8]. Some authors argue that it would fit better into the category of “other specified disorders due to addictive behaviors (6C5Y)” [9•]. These considerations refer to the overlaps of CBSD with substance-related and behavioral addictions regarding phenomenology and proposed underlying mechanisms (e.g., diminished control over the activity, cue-induced craving responses, gratification and compensation processes,

continuation of the activity despite negative consequences) [2, 3, 9, 10, 11].

Buying-shopping patterns have changed with the increase of the e-commerce marketplace and the development of Web 2.0 technologies over the last 20 years [12]. The e-marketplace offers many opportunities for efficient goal-directed information search, price comparisons, and convenient purchasing of a huge variety of products. Many consumers engage in both offline and online buying-shopping, and some strongly prefer online buying-shopping. Research suggests that a subgroup of online customers is likely to develop online CBSD [13, 14]. Initial studies that specifically addressed online CBSD have been conducted more than 15 years ago [15–17]. Data from a German clinical sample ( $n = 122$ ) showed that one-third of patients with CBSD reported excessive buying-shopping on the internet, which was related to higher severity of CBSD [18]. Self-reports of Parisian university students ( $n = 200$ ) indicated a prevalence of online CBSD of 16% [19]. In this context, online CBSD became a recent research topic [20, 21], and the question arises as to whether it would be useful to differentiate between a “predominantly online” and a “predominantly offline” CBSD subtype by analogy with gaming disorder and gambling disorder in the ICD-11 [8].

Recently, a Delphi study was conducted among international experts in the field of CBSD in order to develop potential diagnostic criteria for CBSD [7]. Considering the migration of traditional offline CBSD to the online retail market, experts were asked whether the diagnostic criteria should include a specifier “predominantly offline vs. predominantly online” CBSD. Interestingly, they did not consent on such a specifier [7]. The study did not explore why the experts decided against the specifier. However, various

reasons for the rejection would be conceivable. Experts may not have detected any substantial differences between online and offline CBSD in their clients and argue that the specifier does not add anything useful to the diagnosis. Moreover, due to the scarcity of literature about the systematic comparison between online and offline CBSD, they may have not been aware of any research data that may justify such a specifier.

In our opinion, it is worth reflecting on whether an online subtype of CBSD may have specific clinical implications. An alternative view would be to understand online CBSD as a specific internet-use disorder because it occurs only on the internet. Below, we will take a closer look at both perspectives and will address potential commonalities of online CBSD with offline CBSD or specific internet-use disorders.

### Same-Same: Online CBSD and Offline CBSD

CBSD on the internet shares several key features with offline CBSD (Table 1). These include in the first place diminished control over the acquisition of consumer goods without utilizing them for their intended purposes [7, 22, 23]. Online and offline CBSD are associated with spending much time thinking about buying and shopping (preoccupation) and increasing priority given to these activities. The maladaptive offline/online behavior results in clinically significant distress (e.g., shame, embarrassment, regret, anxiety, depressive symptoms) and/or impairment in different areas of functioning (e.g., indebtedness, familial discord, jeopardizing relationships and career opportunities), and it is continued or even escalated despite the occurrence of those negative consequences [7, 22, 23].

**Table 1** Common features of online CBSD with offline CBSD and specific internet-use disorders

		Online CBSD and offline CBSD	Online CBSD and specific internet-use disorders
Phenomenology (in accordance with ICD-11 clinical guidelines)	Diminished control	Over acquisition of consumer goods without utilizing them for their intended purposes	Overuse of the first-choice internet application
	Priority	Given to buying-shopping	Given to the use of the first-choice internet application
	Continuation or escalation	Despite the occurrence of negative consequences of buying-shopping	Despite the occurrence of negative consequences of the use of the first-choice application
	Clinically significant distress and/or impairments in different areas of life	As a result of buying-shopping activities	As a result of the use of the first-choice application
Affective mechanisms	Affective/craving responses	Toward shopping/buying-related visual cues	Toward first-choice-application-related visual/auditory cues
	Motivation	To experience gratification or to compensate for negative mood states	To experience gratification or to compensate for negative mood states

Similar to offline CBSD [6, 10, 24], individuals with online CBSD show craving responses towards buying/shopping-related visual cues [10, 11, 14, 25••]. The maladaptive online as well as offline buying-shopping activities serve to experience pleasure (gratification) or to compensate negative feelings [26–28]. Research suggests common vulnerability factors for online and offline CBSD, in particular, strong materialistic values, low self-esteem, and identity confusion [15, 27–32]. It appears that both CBSD modes serve to cope with materialistic and narcissistic needs and to escape reality.

It is important to consider certain advantages of the e-marketplace (e.g., shopping in public transport via smartphone, personalized advertisements, easy credit payment systems) that contribute to specific phenomenological characteristics of online CBSD. Frequent, time-consuming, excessive browsing through shopping websites with or without purchasing anything is very typical for online CBSD. Although extensive “window shopping” may also occur in offline CBSD, it is physically impossible to visit a similar number of stores in the offline environment as on the internet in a comparable amount of time. Individuals with online CBSD may not purchase anything on the internet for several reasons, e.g., they try to reduce their money expenses, made progress in therapy, promised stopping overspending to their relatives, have accumulated debts, due to pending court proceedings, or their accounts were locked because of unpaid invoices. Most reasons do not differ from reasons to cut down offline CBSD. However, individuals with online CBSD may also experience reward while spending several hours a day or during nights searching for goods on the internet [33]. This means that individuals with the predisposition for CBSD (i.e., high materialistic values, low self-esteem, identity confusion) may prefer online buying-shopping if they have the expectancy that browsing shopping sites is associated with the prompt experience of pleasure or relief from discomfort [34]. Such time-consuming browsing can crowd out other social, familial, or occupational activities. Affected persons are not protected from online CBSD episodes at work (where they may order goods on the internet via smartphone). Clinically, extensive browsing shopping websites (with simultaneous reduction/absence of online purchasing) should not be overlooked in online CBSD as per the way that dietary restriction behaviors (with simultaneous reduction/absence of compensatory behaviors such as self-induced vomiting) are important to assess, for example, in patients with bulimia nervosa [35].

### Same-Same: Online CBSD and Specific Internet-Use Disorders

Online CBSD has also a lot in common with (potential) specific internet-use disorders, e.g., gaming disorder, pornography-use disorder, or social-network–use disorder

(Table 1). This includes, for example, the diminished control over the use of certain internet sites (i.e., shopping sites) and the increasing priority given to the use of this first-choice internet application (for online CBSD: browsing shopping sites, searching for product information, making orders) [22, 34]. Similar to other specific internet-use disorders, maladaptive excessive online buying-shopping activities are continued or escalated despite negative consequences (e.g., clinical significant distress, psychosocial problems, indebtedness, impairment in important areas of functioning).

With regard to affective aspects, cue-induced craving responses towards application-specific cues have been found in several internet-use disorders [34, 36, 37] and also in individuals with a propensity for online CBSD [14, 25••]. Similar to other specific internet-use disorders [34, 38, 39], in online CBSD the use of shopping sites results in the quick experience of positive feelings (gratification) or relief from negative feelings (compensation) and is motivated by the anticipation of such benefits. Using motives further include the expectancy to search for infinite product information, find an immense variety of products, browse and purchase unobserved (anonymity), avoid social interactions during buying-shopping, satisfy the urge to shop promptly, regulate emotions immediately, and mitigate identity confusion quickly [14–17, 28].

There are various parallels between online CBSD and other internet-use disorders. The triple-A-engine for online pornography-use disorder (i.e., accessibility, affordability, anonymity) [40] could also be used to describe internet-specific aspects that accelerate the development and maintenance of online CBSD. Of interest are also the connections of online CBSD with social-network–use disorder [41–44]. In college students from Singapore ( $n = 1110$ ), those participants who were at-risk for social-network–use disorder were also at risk for online CBSD [44]. The relationship between problematic social-network use and the risk for online CBSD in a Chinese convenience sample ( $n = 1109$ ) was mediated by financial social comparison and materialism [42]. Buying-shopping and communicating on the internet are popular behaviors often connected via in-app shopping advertisements on social networks. A bidirectional relationship between the two (potential) disorders is possible. Communicating about products via social networks may generate excitement and may also trigger cue reactivity and craving as well as social comparisons with other customers and accentuate the tendency towards materialism and CBSD, and vice versa [16, 42]. In addition to these rather environmental aspects, there might be common vulnerability factors for social-network–use disorder and online CBSD such as social anxiety, narcissistic traits, and identity confusion [31, 43, 45–47].

## Conclusions

Online CBSD shares many commonalities with both offline CBSD and specific internet-use disorders, whereas the overlaps are probably not exhaustive. Distinguishing between a “predominantly offline” and a “predominantly online” subtype of CBSD would be consistent with the ICD-11 subtyping approach for gaming and gambling disorders [8]. However, this approach has been debated even in the context of gaming disorder [48]. It is questionable of whether splitting CBSD into an offline and online subtype will still be valuable in the near future. In the course of the increasing digitalization of everyday life and further expansion of the e-commerce marketplace, differentiating between online and offline CBSD may be superfluous because online buying-shopping may become the preferred mode for almost everyone. Then, online and offline buying-shopping could be so intertwined that it may no longer make sense to distinguish between them.

An alternative view would be to understand online CBSD as a specific internet-use disorder. Many of the phenomenological features (e.g., time-consuming browsing) and mechanisms (e.g., internet using motives) of online CBSD may suggest such a categorization [14, 17, 34]. One important question is whether online CBSD can develop independently from offline CBSD or only as a medial transformation of offline CBSD into online CBSD. Both perspectives are conceivable: that online CBSD represents a standalone specific internet-use disorder or the online subtype of CBSD. However, until more is known about the etiology, underlying affective and cognitive mechanisms, psychosocial correlates, comorbidity profiles, and treatment of online CBSD, the question still remains unanswered. Future research should examine which approach may have clinical utility and indicates specific treatment options and better outcomes: a categorization within CBSD (“predominantly online CBSD” and “predominantly offline CBSD”) or within the group of specific internet-use disorders. Moreover, future studies should shed more light on common vulnerability and shared underlying affective and cognitive mechanisms of online CBSD and social-network-use disorder (and maybe other specific internet-use disorders), resulting in possible transdiagnostic interventions.

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## References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. Psychiatrie KE. Ein Lehrbuch für Studierende und Ärzte. Leipzig: Verlag von Johann Ambrosius Barth; 1909.
2. Müller A, Brand M, Claes L, Demetrovics Z, de Zwaan M, Fernandez-Aranda F, et al. Buying-shopping disorder-is there enough evidence to support its inclusion in ICD-11? *CNS Spectr*. 2019;24(4):374–9. <https://doi.org/10.1017/S1092852918001323>.
3. Kyrios M, Trotzke P, Lawrence L, Fassnacht DB, Ali K, Laskowski NM, et al. Behavioral neuroscience of buying-shopping disorder: a review. *Curr Behav Neurosci Rep*. 2018;5:263–70. <https://doi.org/10.1007/s40473-018-0165-6>.
4. Hague B, Hall J, Kellett S. Treatments for compulsive buying: a systematic review of the quality, effectiveness and progression of the outcome evidence. *J Behav Addict*. 2016;5(3):379–94. <https://doi.org/10.1556/2006.5.2016.064>.
5. Maraz A, Griffiths MD, Demetrovics Z. The prevalence of compulsive buying: a meta-analysis. *Addiction*. 2016;111(3):408–19. <https://doi.org/10.1111/add.13223>.
6. Trotzke P, Brand M, Starcke K. Cue-reactivity, craving, and decision making in buying disorder: a review of the current knowledge and future directions. *Curr Addict Rep*. 2017;4(3):246–53. <https://doi.org/10.1007/s40429-017-0155-x>.
7. Müller A, Laskowski NM, Trotzke P, Ali K, Fassnacht D, de Zwaan M et al. Proposed diagnostic criteria for compulsive buying-shopping disorder: a Delphi expert consensus study. *J Behav Addict*. 2021;10(2):208–222. **The study is relevant to the topic as it provides tentative diagnostic criteria for compulsive buying-shopping disorder.**
8. WHO. International Classification of Diseases 11<sup>th</sup> revision. <https://icd.who.int/en/>. 2019. <https://icd.who.int/en/>. Accessed 2021–01–13.
9. Brand M, Rumpf HJ, Demetrovics Z, Müller A, Stark R, King DL et al. Which conditions should be considered as disorders in the International Classification of Diseases (ICD-11) designation of “other specified disorders due to addictive behaviors”? *J Behav Addict*. 2020. <https://doi.org/10.1556/2006.2020.00035>. **The paper suggests meta-level criteria for considering potential addictive behaviors as “other specified disorders due to addictive behaviors” in the ICD-11.**
10. Starcke K, Antons S, Trotzke P, Brand M. Cue-reactivity in behavioral addictions: a meta-analysis and methodological considerations. *J Behav Addict*. 2018;7(2):227–38. <https://doi.org/10.1556/2006.7.2018.39>.
11. Trotzke P, Starcke K, Pedersen A, Brand M. Dorsal and ventral striatum activity in individuals with buying-shopping disorder during cue-exposure: a functional magnetic resonance imaging study. *Addict Biol*. 2021:e13073. <https://doi.org/10.1111/adb.13073>.



12. VanHoose D. *Ecommerce economics*. Oxfordshire: Taylor & Francis; 2011.
13. Augsburg M, Wenger A, Haug S, Achab S, Khazaal Y, Billieux J, et al. The concept of buying-shopping disorder: comparing latent classes with a diagnostic approach for in-store and online shopping in a representative sample in Switzerland. *J Behav Addict*. 2020;9(3):808–17. <https://doi.org/10.1556/2006.2020.00051>.
14. Trotzke P, Starcke K, Müller A, Brand M. Pathological buying online as a specific form of Internet addiction: a model-based experimental investigation. *PLoS ONE*. 2015;10(10): e0140296. <https://doi.org/10.1371/journal.pone.0140296>.
15. Dittmar H, Long K, Bond R. When a better self is only a button click away: associations between materialistic values, emotional and identity-related buying motives, and compulsive buying tendency online. *J Soc Clin Psychol*. 2007;26(3):334–61. <https://doi.org/10.1521/jscp.2007.26.3.334>.
16. LaRose R, Eastin ME. Is online buying out of control? Electronic commerce and consumer self-regulation. *J Broadcast Electron Media*. 2002;46(4):549–64.
17. Kukar-Kinney M, Ridgway NM, Monroe KB. The relationship between consumers' tendencies to buy compulsively and their motivations to shop and buy on the Internet. *J Retail*. 2009;85(3):298–307.
18. ● Müller A, Steins-Loeber S, Trotzke P, Vogel B, Georgiadiou E, de Zwaan M. Online shopping in treatment-seeking patients with buying-shopping disorder. *Compr Psychiatry*. 2019;94:152120. <https://doi.org/10.1016/j.comppsy.2019.152120>. **The study provides information on the prevalence of addictive online shopping in treatment-seeking patients with compulsive buying-shopping disorder.**
19. Duroy D, Gorse P, Lejoyeux M. Characteristics of online compulsive buying in Parisian students. *Addict Behav*. 2014;39(12):1827–30. <https://doi.org/10.1016/j.addbeh.2014.07.028>.
20. Brand M, Müller A, Stark R, Steins-Loeber S, Klucken T, Montag C, et al. Addiction Research Unit: affective and cognitive mechanisms of specific Internet-use disorders (ACSID). *Addict Biol*. 2021;26(6):e13087. <https://doi.org/10.1111/adb.13087>.
21. Potenza MN, Higuchi S, Brand M. Call for research into a wider range of behavioural addictions. *Nature*. 2018;555(7694):30.
22. Müller A, Brand M, Mitchell JE, de Zwaan M. Internet-shopping disorder. In: Faust D, Faust K, Potenza MN, editors. *The Oxford handbook of digital technologies and mental health*. New York : Oxford University Press; 2020. p. 214–25.
23. McElroy SL, Keck PE Jr, Pope HG Jr, Smith JM, Strakowski SM. Compulsive buying: a report of 20 cases. *J Clin Psychiatry*. 1994;55(6):242–8.
24. Voth EM, Claes L, Georgiadiou E, Selle J, Trotzke P, Brand M, et al. Reactive and regulative temperament in patients with compulsive buying and non-clinical controls measured by self-report and performance-based tasks. *Compr Psychiatry*. 2014;55(7):1505–12. <https://doi.org/10.1016/j.comppsy.2014.05.011>.
25. ● Trotzke P, Starcke K, Müller A, Brand M. Cue-induced craving and symptoms of online-buying-shopping disorder interfere with performance on the Iowa Gambling Task modified with online-shopping cues. *Addict Behav*. 2019;96:82–8. <https://doi.org/10.1016/j.addbeh.2019.04.008>. **The experimental study provides insight into affective and cognitive mechanisms in online compulsive buying-shopping disorder.**
26. Müller A, Mitchell JE, Crosby RD, Cao L, Johnson J, Claes L, et al. Mood states preceding and following compulsive buying episodes: an ecological momentary assessment study. *Psychiatry Res*. 2012;200(2–3):575–80. <https://doi.org/10.1016/j.psychres.2012.04.015>.
27. Kellett S, Bolton JV. Compulsive buying: A cognitive-behavioural model. *Clin Psychol Psychother*. 2009;16(2):83–99. <https://doi.org/10.1002/cpp.585>.
28. Rose S, Dhandayudham A. Towards an understanding of Internet-based problem shopping behaviour: The concept of online shopping addiction and its proposed predictors. *J Behav Addict*. 2014;3(2):83–9. <https://doi.org/10.1556/JBA.3.2014.003>.
29. Müller A, Claes L, Georgiadiou E, Möllenkamp M, Voth EM, Faber RJ, et al. Is compulsive buying related to materialism, depression or temperament? Findings from a sample of treatment-seeking patients with compulsive buying. *Psychiatry Res*. 2014;216(1):103–7. <https://doi.org/10.1016/j.psychres.2014.01.012>.
30. Müller A, Claes L, Kyrios M. Object attachment in buying-shopping disorder. *Curr Opin Psychol*. 2021;39:115–20. <https://doi.org/10.1016/j.copsyc.2020.08.019>.
31. Müller A, Claes L, Birlin A, Georgiadiou E, Laskowski NM, Steins-Loeber S, et al. Associations of buying-shopping disorder symptoms with identity confusion, materialism, and socially undesirable personality features in a community sample. *Eur Addict Res*. 2021;27(2):142–50. <https://doi.org/10.1159/000511078>.
32. Faber RJ, Vohs KD. To buy or not to buy? Self-control and self-regulatory failure in purchase behavior. In: Baumeister RF, Vohs KD, editors. *Self-regulation: research, theory, and applications*. New York: The Guilford Press; 2004. p. 517–27.
33. Meyer V, Laskowski NM, de Zwaan M, Müller A. Kaufen bis zum Umfallen - ein Fallbericht [Shop 'til you drop - A case report]. *Verhaltenstherapie Verhaltensmedizin*. 2019;40:268–74.
34. Brand M, Young KS, Laier C, Wölfling K, Potenza MN. Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: an Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neurosci Biobehav Rev*. 2016;71:252–66. <https://doi.org/10.1016/j.neubiorev.2016.08.033>.
35. Elran-Barak R, Sztainer M, Goldschmidt AB, Crow SJ, Peterson CB, Hill LL, et al. Dietary restriction behaviors and binge eating in anorexia nervosa, bulimia nervosa and binge eating disorder: trans-diagnostic examination of the restraint model. *Eat Behav*. 2015;18:192–6. <https://doi.org/10.1016/j.eatbeh.2015.05.012>.
36. Wegmann E, Stodt B, Brand M. Cue-induced craving in Internet-communication disorder using visual and auditory cues in a cue-reactivity paradigm. *Addict Res Theory*. 2018;26(4):306–14. <https://doi.org/10.1080/16066359.2017.1367385>.
37. Brand M, Rumpf HJ, Demetrovics Z, King DL, Potenza MN, Wegmann E. Gaming disorder is a disorder due to addictive behaviors: evidence from behavioral and neuroscientific studies addressing cue reactivity and craving, executive functions, and decision-making. *Curr Addict Rep*. 2019;6(3):296–302. <https://doi.org/10.1007/s40429-019-00258-y>.
38. Dong G, Potenza MN. A cognitive-behavioral model of Internet gaming disorder: theoretical underpinnings and clinical implications. *J Psychiatr Res*. 2014;58:7–11. <https://doi.org/10.1016/j.jpsychires.2014.07.005>.
39. Brand M, Wegmann E, Stark R, Müller A, Wölfling K, Robbins TW, et al. The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neurosci Biobehav Rev*. 2019;104:1–10. <https://doi.org/10.1016/j.neubiorev.2019.06.032>.
40. Cooper A. Sexuality and the Internet: surfing into the new millennium. *Cyberpsychol Behav*. 1998;1(2):187–93.

41. Zheng Y, Yang X, Zhou R, Niu G, Liu Q, Zhou Z. Upward social comparison and state anxiety as mediators between passive social network site usage and online compulsive buying among women. *Addict Behav.* 2020;111: 106569. <https://doi.org/10.1016/j.addbeh.2020.106569>.
42. Sharif SP, She L, Yeoh KK, Naghavi N. Heavy social networking and online compulsive buying: the mediating role of financial social comparison and materialism. *J Mark Theory Pract.* 2021:1–13. <https://doi.org/10.1080/10696679.2021.1909425>.
43. Sharif SP, Khanekharab J. Identity confusion and materialism mediate the relationship between excessive social network site usage and online compulsive buying. *Cyberpsychol Behav Soc Netw.* 2017;20(8):494–500. <https://doi.org/10.1089/cyber.2017.0162>.
44. Tang CS, Koh YY. Online social networking addiction among college students in Singapore: comorbidity with behavioral addiction and affective disorder. *Asian J Psychiatr.* 2017;25:175–8. <https://doi.org/10.1016/j.ajp.2016.10.027>.
45. Wegmann E, Brand M. A narrative overview about psychosocial characteristics as risk factors of a problematic social networks use. *Curr Addict Rep.* 2019;6(4):402–9. <https://doi.org/10.1007/s40429-019-00286-8>.
46. Müller A, Mitchell JE, Black DW, Crosby RD, Berg K, de Zwaan M. Latent profile analysis and comorbidity in a sample of individuals with compulsive buying disorder. *Psychiatry Res.* 2010;178(2):348–53. <https://doi.org/10.1016/j.psychres.2010.04.021>.
47. Claes L, Luyckx K, Vogel B, Verschueren M, Müller A. Identity processes and clusters in individuals with and without pathological buying. *Psychiatry Res.* 2018;267:467–72. <https://doi.org/10.1016/j.psychres.2018.06.003>.
48. Kiraly O, Demetrovics Z. Inclusion of gaming disorder in ICD has more advantages than disadvantages. *J Behav Addict.* 2017;6(3):280–4. <https://doi.org/10.1556/2006.6.2017.046>.

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