



## Online compulsive buying-shopping disorder and social networks-use disorder: More similarities than differences?

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### ABSTRACT

**Background:** Studies in convenience, non-clinical samples of young adults suggest overlap between online compulsive buying-shopping disorder (OCBSD) and social-networks-use disorder (SNUD). Considering the dearth of research, this study investigated OCBSD and SNUD in clinical samples.

**Methods:** Women with either OCBSD ( $n = 37$ ) or SNUD ( $n = 41$ ) were compared regarding sociodemographic variables, use time of the first-choice application, OCBSD/SNUD severity, general internet use, impulsivity, materialism, perceived chronic stress and the frequency of viewing posts of influencers and the urge to visit shopping websites or social networks after viewing influencer posts.

**Results:** Women in the OCBSD group were older, more often employed, had less often a qualification for university entrance, indicated a lower daily use time of the first-choice application and higher materialistic values as compared to those in the SNUD group. No group differences emerged regarding general internet use, impulsivity and chronic stress. Regression models indicate that chronic stress predicted the symptom severity in the SNUD but not in the OCBSD group. The SNUD group reported a higher frequency of viewing influencer posts as compared to the OCBSD group. The urge for online shopping or using social networks after viewing influencer posts did not significantly differ between both groups.

**Conclusion:** The findings suggest commonalities and distinct features of OCBSD and SNUD which require further investigation.

### 1. Introduction

Poorly controlled use of online shopping platforms and excessive use of online social networks are considered as problematic internet-related activities within the context of behavioral addictions [1]. Both online activities are not recognized as separate mental disorders in ICD-11 [2]. Compulsive buying-shopping disorder (CBSD) is mentioned as an example of “other specific impulse control disorders” in the ICD-11 coding tool [2], not distinguishing between offline and online shopping. Following this approach, we use the term online compulsive buying-shopping disorder (OCBSD) for clinically relevant pathological buying on the internet throughout the text. Considering similarities of CBSD with other behavioral addictions (e.g., gaming disorder), CBSD may also fit the category of “other specified disorders due to addictive behaviors” [3,4]. Likewise, it seems useful to classify problematic social-

networks use within this category, referring to this type of problematic online behaviors as social-networks-use disorder (SNUD) [3,5,6]. Impaired control over the use of the first-choice internet application (i. e., online shopping platforms for OCBSD, social networks and online-communication applications for SNUD) is a core diagnostic criterion of both internet-use disorders [1,3,6,7]. OCBSD is characterized by time-consuming online searching for consumer goods and excessive online purchasing of items without utilizing them for their intended purposes after the acquisition [1,8]. SNUD refers to the addictive and excessive use of social networks and online-communication applications that leads to negative consequences in daily life [9,10]. Evidence from community and clinical samples shows that OCBSD results in negative consequences such as clinical distress, accumulation of debt, family conflicts, reduced quality of life and impairments in other areas of life [11–13]. In some studies, SNUD has also been shown to result in negative outcomes such

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as distress and decreased well-being [14,15]. However, the level of suffering and functional impairments in daily life due to poorly controlled use of social networks and online-communication applications remains unclear due to the lack of research on SNUD in clinical samples.

With the emergence of social commerce (s-commerce), the bidirectional relationship between OCBS and SNUD is gaining attention in public media and scientific literature [16–21]. Unlike traditional electronic commerce where customers interact with shopping websites that are separate from social networks, s-commerce involves social networks communities [22,23]. This allows consumers to communicate with each other and “to participate in the marketing, selling, comparing, curating, buying, and sharing of products and services in both online and off-line marketplaces, and in communities” [24], p. 95]. Frequently communicating about goods on social networks can generate a demand for those products. In this context, social networks influencers gained popularity particularly among young adults. They play a vital role in s-commerce as ‘third party endorsers’ by representing themselves as experts and promoting brands and products on their social network channels [25–28]. Following social network celebrities may nudge or trigger online purchasing of products endorsed by them [26,29].

The use of social networks and online shopping activities are increasingly intertwined, as may also be their problematic use. In addition to the complex s-commercial marketing strategies, shared vulnerability factors may contribute to the link between OCBS and SNUD. However, research concerning the potential underlying mechanisms of OCBS and SNUD is at the beginning. To the best of our knowledge, most studies focusing on the association between SNUD and OCBS examined convenience, non-clinical samples of young adults, and assessed the risk for OCBS and SNUD with self-report measures. Tang and Koh [30] investigated college students from Singapore ( $n = 1110$ ) and reported prevalence estimates of 29.5% for SNUD and 9.3% for OCBS. About 5% of the total sample reported both SNUD and shopping addiction (not differentiating between offline and online) [30]. In a German sample of 56 individuals with problematic social networks use, 39% additionally reported problematic online shopping [31]. The study by Sharif and Khanekharab [19] which included 501 college students from Malaysia indicated that excessive social networks use was related to a higher tendency towards OCBS, partly mediated by higher identity confusion and higher materialism. Similarly, in a study with 1109 Malaysian young adults, the link between OCBS and SNUD was mediated by financial social comparison and materialism [32]. Zheng et al. [21] assessed passive social networks usage, upward social comparison on social networks, state anxiety, and OCBS in a sample of 799 Chinese female undergraduate students. Passive use of social networks applications was associated with OCBS symptoms and upward social comparison, and state anxiety partially mediated this link.

Overall, previous research indicates that there might be an overlap between the two different types of potential internet-use disorders. Nevertheless, they are also discussed as different entities, which might share some communalities [1,33]. Considering the potential convergence of OCBS and SNUD on the one hand and the dearth of research concerning this topic on the other hand, the present pilot study aimed at investigating OCBS and SNUD in clinical samples. Comparing individuals with clinically relevant OCBS and SNUD will shed light on potential overlaps and differences between the two disorders. Given the female preponderance of OCBS in clinical samples [12], the present study focused exclusively on female participants. Women with OCBS and women with SNUD were compared with respect to sociodemographic variables, daily use time of the first-choice application (i.e., social networks, online shopping platforms), symptom severity of either OCBS or SNUD with particular emphasis on the functional impairment in daily life due to the excessive use, and general internet use (i.e., not specified for a preferred application). Considering the potential impact of following social network influencers, we additionally explored the

frequency of viewing posts of influencers and the urge to visit shopping websites or social networks after viewing influencer posts. Furthermore, psychosocial variables, which have been previously identified as potential general predisposing variables resulting in a problematic online behavior [34], were compared between the two groups. This includes materialistic values endorsement, chronic stress, and trait impulsivity. In convenience samples, more symptoms of OCBS or SNUD were associated with higher materialistic values endorsement [35,36] and materialism contributed to the link between OCBS and SNUD [19,32]. Symptoms of OCBS and SNUD were further related to perceived daily stress [10,21,37,38] and impulsivity [39,40]. Given the explorative nature of the study and the lack of research comparing OCBS and SNUD, no formal hypotheses were drawn.

## 2. Material and methods

### 2.1. Procedure

The current sample was drawn from a study on affective and cognitive functions in OCBS and SNUD that is currently being conducted as part of Research Unit ‘Affective and cognitive mechanisms of specific Internet-use disorders’, FOR2974 [33]. Data for the present study were collected from October 2021 to September 2022. Participants were recruited in the behavioral addiction outpatient clinic of the Hannover Medical School, in the University of Duisburg-Essen, in cooperating counseling and treatment facilities for behavioral addictions, and from the general population via mailing lists, online social networks, and word-of-mouth recommendations. Inclusion criteria were clinically relevant case of either OCBS or SNUD, age between 18 and 65 years, and sufficient German language skills. Exclusion criteria were learning or developmental disorders, psychosis, mania, current substance-use disorder (except tobacco), acute suicidal ideations, any psychoactive substances known to interfere with performance in cognitive tasks, and concurrent psychotherapy for OCBS or SNUD. In the present study, only the partial data relevant to the proposed research focus are considered.

Before participants could take part in the study, a telephone screening was conducted to clarify inclusion/exclusion criteria. Participants were then invited for a face-to-face assessment visit. To confirm or reject the diagnosis of OCBS or SNUD, a standardized clinical interview for the assessment of specific internet-use disorders – the slightly adapted AICA-SKI:IBS (see below section Instruments) [41] – was conducted by two trained PhD students (AK and MJ) who were regularly supervised by the last author. The AICA-SKI:IBS is based on the DSM-5 criteria for assessing the symptom severity of gaming disorder and was modified accordingly for the identification of OCBS and SNUD. Participants who exhibited five or more symptoms of either OCBS or SNUD were classified as clinically relevant cases [41]. Individuals who did not fulfill this criterion and those meeting criteria for both OCBS and SNUD were not included in the present study but assigned to other projects of the research unit (i.e. projects addressing risky use of shopping or communication platforms).

The entire study has been pre-registered at the Open Science Framework (OSF) and has been approved by the local ethics committees. All participants gave voluntary informed consent. The recruitment was hosted and conducted at the Hannover Medical School and University of Duisburg-Essen.

### 2.2. Participants

The total sample consisted of 78 female participants aged between 18 and 60 years ( $M = 28.04$ ,  $SD = 9.65$ ). The majority of 69.2% ( $n = 54$ ) reported having a general qualification for university entrance, 15.4% ( $n = 12$ ) had an advanced technical college entrance qualification, 12.8% ( $n = 10$ ) had a middle school diploma and two participants (2.6%) reported ‘other’ as the highest educational qualification. Regarding

employment, 58.6% ( $n = 46$ ) stated that they were in school or vocational training or studying, 34.6% ( $n = 27$ ) were fully or at least partly employed, and 6.4% ( $n = 5$ ) were non-employed or did not provide any information. When asked if the participants were in a committed partnership, 59% ( $n = 46$ ) answered in the affirmative, while 41% ( $n = 32$ ) answered in the negative. Thirty-seven women suffered from OCBSD and 41 women from SNUD. While participants with OCBSD were mostly recruited in behavioral addiction treatment facilities (e.g., outpatient clinic), participants with SNUD had learned of the study through mailing lists, online social networks, and word-of-mouth recommendations. The diagnosis of either OCBSD or SNUD was confirmed via the clinical interview (i.e. participants fulfilled at least five AICA-SKI:IBS criteria; OCBSD:  $M_{AICA} = 7.81$ ,  $SD_{AICA} = 0.94$ ; SNUD:  $M_{AICA} = 7.12$ ,  $SD_{AICA} = 0.98$ ;  $t(76) = 3.16$ ,  $p = .002$ ,  $d = -.72$ ).

## 2.3. Instruments

### 2.3.1. Assessment of criteria for specific internet-use disorders (ACSID-11)

The ACSID-11 [42] is a self-report measure assessing the criteria for specific internet-use disorders in a uniform manner based on the proposed diagnostic criteria for gaming disorder in the ICD-11 [2]: impaired control over the behavior (three items, e.g., “In the past 12 months, have you had trouble keeping track of when you started the activity, for how long, how intensely, or in what situation you did it, or when you stopped?”), increasing priority (three items, e.g., “In the past 12 months, have you lost interest in other activities you used to enjoy because of the activity?”), continuation and escalation (three items, e.g., “In the past 12 months, have you continued or increased the activity even though it has caused you physical or mental complaints/diseases?”) and two additional items assessing functional impairment (e.g., “Thinking about all areas of your life, did the activity cause you suffering in the past 12 months?”). The participants were instructed to indicate which activity on the internet (e.g., gaming, online shopping, online pornography, social networks, online gambling) they have carried out in the last twelve months at least on an occasional level. Each activity was defined, and the participants answered with “yes” or “no”. If an activity was indicated, the participants were shown the corresponding eleven items for each activity according to the format used in the WHO-ASSIST [43]. For each activity, every item had to be answered on two scales: (1) a four-point Likert scale ranging from 0 = “never” to 3 = “often” assessing frequency and (2) a four-point Likert scale ranging from 0 = “not at all intensive” to 3 = “intense” assessing intensity (for a more detailed description see [42]). In this study, only those participants who reported using online shopping applications, social networks, or both were included. For the analysis, we focused on the frequency scale. The item scores were dichotomized as follows: For all criteria, the respective criterion is fulfilled (scores “1”) if at least one of the associated three items was answered with 3 = “often” on the frequency scale. If all items were answered with 2 = “rarely” or lower, the criterion is not fulfilled (scores “0”). An exception to this is the mandatory additional functional impairment criterion. Here, if one of the two items is 2 = “rarely”, and additionally the corresponding rating on the intensity scale was 2 = “rather intense” or 3 = “intense”, the criterion is also scores “1”. The range of the overall sum score could therefore be between 0 and 4 indicating the number of fulfilled criteria.

### 2.3.2. Short compulsive internet use scale (SCIUS)

The SCIUS [44] has been used to investigate disordered internet use in general without specifying it for a preferred application. The version consists of five items (e.g., “How often do you find it difficult to stop using the internet/smartphone when you are online”) measured with a five-point-Likert scale ranging from 0 = “never” to 4 = “very often”. For analyzing disordered internet use in general, a sum score has been calculated. The Cronbach’s  $\alpha = .68$  showed an acceptable reliability.

### 2.3.3. Urge of online buying shopping and using social networks after viewing posts of influencers

Participants were asked regarding the frequency of viewing posts from influencers on social networks in the last four weeks on a five-point Likert scale ranging from 1 = “never” to 5 = “very often”. Two additional items have been formulated: “After watching posts of influencers, I have felt a strong desire to use social networks” and “[...] to go to shopping sites on the internet.”. Each had to be rated on a six-point Likert scale ranging from 1 = “totally disagree” to 6 = “totally agree”. The three items were each analyzed at item level.

### 2.3.4. Material values scale (MVS)

The German version [45] of the short MVS [46] was used to investigate the tendency to adhere to materialistic values. Participants had to respond to 15 items (e.g., “My life would be better if I had certain things that I don’t have yet”) on a five-point Likert scale ranging from 1 = “not at all applicable” to 5 = “very applicable”. There are two core dimensions, namely “centrality/success goal” assessed by eleven items and “happiness” assessed by four items. For the current study, the overall sum score has been used showing a good reliability (Cronbach’s  $\alpha = .89$ ).

### 2.3.5. Trier inventory for chronic stress (TICS)

The TICS [47] has been used to assess perceived chronic stress. The questionnaire consists of 57 items including the dimensions work overload (e.g., “I feel overwhelmed by my tasks”), social overload (e.g., “Sometimes I feel overburdened by my responsibilities toward others”), pressure to perform (e.g., “There are situations in which I find it difficult to be obliging”), work discontent (e.g., “I must meet responsibilities which I am adamantly opposed to”), excessive demands at work (e.g., “In spite of the effort I make, I am unable to manage my tasks properly”), lack of social recognitions (e.g., “I feel that my performance is not recognized enough”), social tensions (e.g., “Arguments I get involved in frequently become lasting conflicts”), social isolation (e.g., “Sometimes I lack the opportunity to articulate my concerns I have no opportunity to discuss things with others”), and chronic worrying (e.g., “Sometimes I am consumed by my worries”) [48]. Participants had to rate each item on a five-point Likert scale ranging from 0 = “never” to 4 = “very often”. For the current study, the overall sum score of the TICS was used to capture perceived chronic psychosocial stress in general, which showed a good reliability (Cronbach’s  $\alpha = .94$ ).

### 2.3.6. Barratt impulsiveness scale-15 (BIS-15)

Trait impulsivity has been assessed with the short German version of the BIS-15 [49]). The scale consists of 15 items assessing non-planning (e.g., “I plan tasks carefully”), motor (e.g., “I act on impulse.”), and attentional impulsivity (e.g., “I don’t pay attention.”). Each item had to be rated on a four-point Likert scale ranging from 1 = “rarely/never” to 4 = “almost always/always”. The overall sum score used showed a good reliability (Cronbach’s  $\alpha = .82$ ).

## 3. Statistical analyses

For investigating group differences in OCBSD and SNUD,  $t$ -tests for independent samples have been analyzed. We used Cohen’s  $d$  as effect size, where  $d \geq .8$  indicates a large,  $d \geq .5$  indicates a medium, and  $d \geq .2$  indicates a small effect [50]. Significance level was  $p < .05$  (two-tailed).  $\chi^2$ -tests were used to test differences in categorical variables. Cramer’s  $V/\phi$  served as the measure of effect size with values of .1, .3, .5 indicating small, medium, and large effects respectively [50]. All expected cell frequencies were greater than 5. We used multiple linear regression separated by group to analyze effects of multiple predictors on OCBSD and SNUD symptoms respectively. According to Cohen [50] an  $R^2$  of .02 indicates a small effect,  $R^2$  of .13 a medium effect, and  $R^2$  of .26 indicates a large effect. The statistical analyses have been conducted with IBM SPSS statistics (version 27) for Mac.

#### 4. Results

The OCBSD group was significantly older than the SNUD group (OCBSD:  $M = 31.27, SD = 12.54$ , range 18 – 60 years; SNUD:  $M = 25.12, SD = 4.38$ , range 19 – 37 years;  $t_{(43,894)} = 2.83, p = .007, d = .67$ ). Further descriptives of the subsamples are shown in [Table 1](#). Women with OCBSD compared to those with SNUD had less often a qualification for university entrance and were more often employed. The SNUD group included more students/trainees as compared to the OCBSD group. Partnership status did not differ between groups.

The descriptive values of the main variables for the overall sample as well as for the participants with OCBSD and SNUD are displayed in [Table 2](#) and [Table 3](#). The OCBSD group indicated an average daily use time of the first-choice application (online shopping platforms) of 2h 15min, which was significantly lower compared to over 5h average daily use time of social networks in the SNUD group (see [Table 2](#)). The group comparisons illustrate significant differences between the subsamples regarding the symptom severity of OCBSD (ACSID-11 shopping) and SNUD (ACSID-11 SNS) in the expected directions, i.e. the OCBSD group showed higher symptom severity of OCBSD as compared to the SNUD group and vice versa (see [Table 2](#)). When we compared the symptom severity of the respective target behavior between the two groups, there was no significant difference ( $t_{(76)} = -.07, p = .446, d = .17$ ) indicating similar manifestations of symptom burden in the two disorder groups.

Focusing on the proposed risk factors, no significant differences in perceived chronic stress, and trait impulsivity could be observed, but the samples differed regarding materialistic values with a higher tendency towards materialism in the OCBSD as compared to the SNUD group (see [Table 3](#)). Regarding online activities, participants with OCBSD and SNUD showed no significant differences in disordered internet use in general measured with the SCIOUS [42]. Participants with SNUD viewed influencer posts on social networks significantly more often than individuals with OCBSD. After viewing the influencer posts, the SNUD group tended to exhibit a higher urge to use social networks than the OCBSD group. However, this group difference was not significant. There was also no significant difference regarding the urge to shop online after following influencer posts, with both groups on average indicating medium urges (see [Table 3](#)).

Using multiple regression analysis, we aimed to investigate whether specific vulnerability factors have incremental effects on symptom severity of either OCBSD or SNUD if all predictors were considered together (i.e. materialistic values, MVS; perceived chronic stress, TICS; trait impulsivity BIS-15). For OCBSD, the model did not explain a significant amount of variance in symptom severity (dependent variable ACSID-11 shopping;  $F_{(3,36)} = 2.09, p = .121, R^2 = .16$ ). For SNUD, the model was significant and explained about 28% of the variance in symptom severity (dependent variable ACSID-11 SNS);  $F_{(3,40)} = 4.77, p =$

.007,  $R^2 = .28$ ). Looking at the coefficients, the main and only significant predictor for SNUD symptom severity was perceived chronic stress as measured with the TICS (see [Table 4](#)).

#### 5. Discussion

The findings indicate some sociodemographic differences between women with OCBSD and women with SNUD. In the present study, participants with SNUD were younger, had more often a qualification for university entrance and were more often students or trainees than those with OCBSD, which explains the group difference in employment status. The relatively high proportion of participants with a general qualification for university in this group may indicate a selection bias through e.g., different recruitment channels, which limits the generalizability of the results. The women with OCBSD were recruited primarily in clinical settings (e.g., outpatient consultations), whereas the women with SNUD were recruited through advertisements and social networks. This is probably due to the fact that a few treatment services are already available for OCBSD, which is unfortunately not the case for SNUD. The young age of the SNUD group is in line with past research indicating SNUD is prevalent in adolescents and young adults [6]. Although the OCBSD group was older than the SNUD group, it is notable that the age of the present OCBSD group is lower than in previous samples of patients with CBSD (not differentiating between offline and online CBSD) where it ranged between 41 and 45 years [51–54]. This could be related to the fact that the current sample contained women who predominantly shop online. This activity is more pronounced in younger age groups than traditional shopping [12,55].

It appears that participants with SNUD spent much more time on communication platforms than participants with OCBSD did on online shopping platforms. This does not seem surprising considering social networks are used more for social exchange and communication with others by posting comments, pictures, or videos than shopping platforms [9,10]. People engage in intense social networks use to stay in contact with others, while they use shopping platforms to search for consumer items and good deals. Highly frequent use of the first-choice application across the day resulting in higher daily use time may be more typical for SNUD than for OCBSD. Individuals with OCBSD usually describe problem behavior that occurs episodically, e.g., in the form of daily, weekly, or multiple weekly shopping episodes [56,57] and many individuals with OCBSD do not purchase exclusively online but also in brick-and-mortar stores [12,58].

Although the groups differed in use time of the first-choice application, they showed similar manifestation not only of disordered internet use in general (measured with the SCIOUS; [44]) and symptom severity of either OCBSD or SNUD but also impairments in daily functioning due to the use of the first-choice application. Of particular interest is that in

**Table 1**

Descriptive statistics of the overall sample and the subsamples including participants with online compulsive buying shopping disorder (OCBSD) and with social-networks-use disorder (SNUD) as well as the group comparisons.

	Overall ( $n = 78$ )		OCBSD ( $n = 37$ )		SNUD ( $n = 41$ )		Group comparisons
	<i>N</i>	(%)	<i>N</i>	(%)	<i>n</i>	(%)	
<i>Qualification for university entrance:</i>							
Yes	54	(69.2)	16	(43.2)	38	(92.7)	$\chi^2_{(1)} = 21.29, p < .001, \phi = .53$
No	24	(30.8)	21	(56.8)	3	(7.3)	
<i>In school, vocational training, studying</i>							
Yes	46	(58.6)	13	(35.1)	33	(80.5)	$\chi^2_{(1)} = 16.53, p < .001, \phi = .46$
No	32	(41.0)	24	(64.9)	8	(19.5)	
<i>Fully or partly employed</i>							
Yes	27	(34.6)	19	(51.4)	8	(19.5)	$\chi^2_{(1)} = 8.71, p = .003, \phi = -.33$
No	51	(65.4)	18	(48.6)	33	(80.5)	
<i>Living in committed partnership:</i>							
Yes	46	(59.0)	18	(48.6)	28	(68.3)	$\chi^2_{(1)} = 3.10, p = .078, \phi = .20$
No	32	(41.0)	19	(51.4)	13	(31.7)	

**Table 2**

Descriptive values considering daily use time of first choice application and symptom severity of the overall sample and the subsamples including participants with online compulsive buying shopping disorder (OCBSD) and with social-networks-use disorder (SNUD) as well as the group comparisons using t-tests for independent samples.

	Overall (n = 78)		OCBSD (n = 37)		SNUD (n = 41)		Group comparisons <i>t</i> -test
	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	
Daily use time target behavior (min)	225.21 (127.29)	12.5 – 750	134.93 (68.29)	12.5 – 292.5	306.67 (112.49)	150 – 750	$t_{(76)} = -8.04, p < .001,  d  = 1.82$
ACSID-11 shopping	1.64 (1.48)	0 – 4	2.59 (1.30)	0 – 4	0.78 (1.04)	0 – 4	$t_{(76)} = 8.84, p \leq .001,  d  = 1.55$
ACSID-11 SNS <sup>1</sup>	2.38 (1.34)	0 – 4	1.89 (1.43)	0 – 4	2.81 (1.12)	0 – 4	$t_{(74)} = -3.14, p = .002,  d  = .721$
Number of cases (%)							
<i>ACSID-11 target behavior: impaired control (IC)</i>							
IC criterion not met	8	(10.26)	5	(13.51)	3	(7.31)	$\chi^2(1) = 0.81, p = .368, V = .102$
IC criterion met	70	(89.74)	32	(86.49)	38	(92.68)	
<i>ACSID-11 target behavior: increased priority (IP)</i>							
IP criterion not met	32	(41.03)	18	(48.65)	14	(34.15)	$\chi^2(1) = 1.69, p = .194, V = .147$
IP criterion met	46	(58.97)	19	(51.35)	27	(65.85)	
<i>ACSID-11 target behavior: continuation/escalation (CE)</i>							
CE criterion not met	43	(55.13)	21	(56.76)	22	(53.66)	$\chi^2(1) = 0.08, p = .784, V = .031$
CE criterion met	35	(44.87)	16	(43.24)	19	(46.34)	
<i>ACSID-11 target behavior: functional impairment/ marked distress (FI)</i>							
FI criterion not met	18	(23.08)	8	(21.62)	10	(24.39)	$\chi^2(1) = 0.08, p = .772, V = .033$
FI criterion met	60	(76.92)	29	(78.38)	31	(75.61)	

**Note.** <sup>1</sup> only 37 participants with OCBSD reported using social networks; ACSID-11 = 11-item Assessment of Criteria for Specific Internet-use Disorders

**Table 3**

Descriptive values considering the vulnerability factors of the overall sample and the subsamples including participants with online compulsive buying shopping disorder (OCBSD) and with social-networks-use disorder (SNUD) as well as the group comparisons using t-tests for independent samples.

	Overall (n = 78)		Online buying-shopping disorder (n = 37)		Social-networks-use disorder (n = 41)		Group comparisons
	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	
MVS sum score	44.36 (11.78)	20 – 69	47.11 (11.65)	26 – 69	41.88 (11.49)	20 – 65	$t_{(76)} = 2.00, p = .050,  d  = .452$
TICS sum score	25.30 (7.99)	6 – 44	26.22 (6.86)	13 – 44	24.46 (8.89)	6 – 43	$t_{(76)} = 0.97, p = .337,  d  = .219$
BIS-15 sum score	34.28 (7.56)	16 – 52	35.30 (7.58)	20 – 52	33.37 (7.52)	16 – 52	$t_{(76)} = 1.13, p = .263,  d  = .256$
SCIUS sum score	13.64 (3.51)	3 – 20	13.27 (3.66)	3 – 20	13.98 (3.38)	7 – 19	$t_{(76)} = -0.89, p = .379,  d  = .209$
Frequency of viewing influencer posts <sup>1</sup>	3.54 (1.73)	1 – 5	3.35 (1.59)	1 – 5	4.12 (1.05)	1 – 5	$t_{(76)} = -2.55, p = .015,  d  = .579$
Urge for using social networks after influencer posts	3.54 (1.73)	1 – 6	3.24 (1.91)	1 – 6	3.80 (1.54)	1 – 6	$t_{(76)} = -1.44, p = .154,  d  = .326$
Urge for online shopping after influencer posts	3.64 (1.77)	1 – 6	3.68 (1.96)	1 – 6	3.61 (1.60)	1 – 6	$t_{(76)} = 0.16, p = .870,  d  = .037$

**Note.** <sup>1</sup> all participants indicated to be familiar with influencer posts. MVS = Material Values Scale; TICS = Trier Inventory for Chronic Stress; BIS-15 = 15-item Barratt Impulsiveness Scale; SCIUS = Short Compulsive Internet Use Scale.

**Table 4**

Coefficients of the multiple regression models investigating effects of materialistic values (MVS), chronic stress (TICS), and trait impulsivity (BIS-15) on the symptom severity (ACSID-11) of individuals with online compulsive buying shopping disorder (OCBSD) and social-networks-use disorder (SNUD).

Model	Coefficients				
	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	<i>t</i>	<i>p</i>
<i>OCBSD (DV = ACSID-11 shopping)</i>					
MVS sum score	.011	.020	.097	0.53	.598
TICS sum score	.055	.035	.290	1.58	.125
BIS-15 sum score	.029	.028	.167	1.01	.320
<i>SNUD (DV = ACSID-11 SNS)</i>					
MVS sum score	-.001	.015	-.009	-0.06	.954
TICS sum score	.067	.019	.531	3.52	.001
BIS-15 sum score	<.001	.022	.002	0.01	.989

**Note.** DV = dependent variable; ACSID-11 = 11-item Assessment of Criteria for Specific Internet-use Disorders; MVS = Material Values Scale; TICS = Trier Inventory for Chronic Stress; BIS-15 = 15-item Barratt Impulsiveness Scal

both groups the ACSID-11 [42] criterion most strongly met is the *loss of control criterion*. This underscores the importance of this criterion for diagnosing OCBSD or SNUD and fits with the ICD-11 approach for other behavioral addictions [2] where impaired control over the behavior is a central diagnostic criterion (e.g., for gaming disorder) [59,60]. The ACSID-11 *functional impairment/ marked distress criterion* was also met very frequently in both groups, illustrating its importance for diagnosing both potential internet-use disorders and supporting findings, according to which OCBSD and SNUD result in high levels of impairment [9,12,14].

Thereby, it is remarkable that all participants have been diagnosed as individuals suffering from one specific type of problematic internet-use based on the DSM-5 criteria within a clinical interview, which has been supported by the ACSID-11 focusing on the ICD-11 diagnostic criteria for disorders due to addictive behaviors [42]. Although a clinical validation of the ACSID-11 is still pending, these first results underline that the instrument can well differentiate between symptoms caused using different types of specific online applications. A further validation of the

clinical instrument as well as a comparison of the diagnostic criteria based on the DSM-5 and the ICD-11 should be done in the future. This is especially relevant since differentiations between peripheral features and core criteria have already been recommended for the diagnostic criteria of the DSM-5 [59–63], which could result in an alignment between the DSM-5 and ICD-11 symptoms.

While all participants were familiar with influencer posts, individuals with SNUD reported a higher frequency of viewing these posts as compared to individuals with OCBSO. The urge for online shopping or using social networks after viewing influencer posts did not significantly differ between both samples. Effect sizes suggest that the SNUD group tended to show higher urges for using social networks as compared to the OCBSO group. However, overall, both groups indicated medium urges for both activities. In further studies, the impact of influencer posts on the use of different applications should be assessed in more detail to capture potential differences between internet-use disorders.

The results on possible predisposing factors for OCBSO/SNUD are difficult to relate to the literature, as no findings comparing individuals with OCBSO or SNUD with respect to materialistic values endorsement, trait impulsivity, and perceived chronic stress have been published so far. In the present sample, there were no significant differences between women with OCBSO and women with SNUD regarding impulsivity and perceived stress. Presumably, both are nonspecific predisposing factors for the two potential internet-use disorders. When taking the effect sizes of the group comparisons into account, it may indicate a slight tendency for individuals with OCBSO to have higher scores on impulsivity and chronic stress compared to individuals with SNUD, whereas the effects were not significant in the current (relatively small) samples. In terms of the materialistic values endorsement, individuals with OCBSO showed a higher tendency for it, as compared to individuals with SNUD, which can be seen as an indication of the specificity of this predisposing factor for OCBSO [35].

Although there was no clear difference in perceived chronic stress between groups of the present sample, the level of stress had an effect on symptom severity in the SNUD group, while, in contrast, it did not have any effect on symptom severity in the OCBSO group. This may indicate differences in mechanisms of development and maintenance of OCBSO and SNUD. One may speculate that stress vulnerability and OCBSO rather co-occur, or their relationship is influenced by other (moderating) factors, whereas there might be a direct association between perceived chronic stress and SNUD in clinical samples. With the results of the current cross-sectional study, we cannot infer causality in any direction. This should be subject of further longitudinal investigations. Most previous studies examining the relationship between SNUD and perceived daily stress in convenience samples indicated a positive correlation between the two variables, whereas the studies were also cross-sectional, and findings were not completely conclusive [38,39,64,65]. It seems useful to distinguish between the influence of chronic and acute stress on the expression of OCBSO or SNUD in future research. To examine stress vulnerability, we made use of the TICS which measures perceived chronic stress [47]. Considering that individuals with OCBSO do not show a continuous but rather an episodic loss of control over consumption [56,57], which might be triggered primarily by acute stressful experiences, it is reasonable to conclude that we did not capture this relationship well with the TICS [47]. Alternatively, the assessment of biomarkers such as hair cortisol could be helpful to investigate the role of chronic stress in OCBSO and SNUD [66], while the measurement of individual cortisol responses under a standardized psychosocial laboratory stress induction seems reasonable to investigate the impact of acute stress [67].

To our knowledge, this is the first study that directly compared individuals with a clinically relevant symptom severity of either OCBSO or SNUD. On the one hand, the present investigation of samples with high symptom levels of OCBSO or SNUD allows a first insight into the overlaps and differences between the two potential internet-use disorders. On the other hand, there are limitations that should be considered when

interpreting the results. First, the initial nature of our study, cross-sectional design, relatively small sample size, potential selection bias and inclusion of only women limit the generalizability of our findings. Second, the use of self-report measures entails the shortcomings known for questionnaires such as social desirability bias. Third, other potentially important variables were not considered. Specific technological advances and psychological aspects that may contribute to the OCBSO-SNUD-convergence should be investigated in further research. This includes addictive features of online platforms [68] as well as theoretical concepts such as fear of missing out [69], need to belong [36,70], social comparison [71] and identity confusion [72].

## 6. Conclusions

The results indicate that women with either OCBSO or SNUD show common characteristics in terms of (a) similar severity of symptoms and functional impairment/distress in everyday life due to the specific problematic online behavior, (b) similar levels of trait impulsivity and perceived chronic stress, and (c) similar urges for online shopping and using social networks after viewing influencer posts. However, the results also indicate specific differences in terms of (a) individual materialistic values, (b) frequency of viewing influencer posts, and (c) effects of perceived chronic stress on symptom severity. It could be discussed that, especially in the case of an OCBSO, online shopping itself is no longer clearly separated from the use of other applications such as communication platforms. A blending between the two specific forms can already be observed placing vulnerable individuals at risk of developing multiple types of specific internet-use disorders. It would be worth investigating which technology features, individual predisposing factors, affective and cognitive mechanisms and dysfunctional coping processes contribute to either OCBSO or SNUD, or to the convergence of both.

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## Declaration of Competing Interest

None.

## Data availability statement

The data presented in this study are openly available at <https://doi.org/10.26068/mhhrpm/20230426-000>.

## References

- [1] Fineberg NA, Menchon JM, Hall N, Dell’Osso B, Brand M, Potenza MN, et al. Advances in problematic usage of the internet research - A narrative review by experts from the European network for problematic usage of the internet. *Compr Psychiatry* 2022;118:152346. <https://doi.org/10.1016/j.comppsy.2022.152346>.
- [2] WHO. ICD-11 for mortality and morbidity statistics (Version: 01/2023). <https://icd.who.int/en2023>. Retrieved from <https://icd.who.int/en/>. April 29, 2023.
- [3] 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;11:150–9. <https://doi.org/10.1556/2006.2020.00035>.
- [4] Thomas TA, Joshi M, Trotzke P, Steins-Loeber S, Müller A. Cognitive functions in compulsive buying-shopping disorder: a systematic review. *Curr Behav Neurosci Rep* 2023;1–19. <https://doi.org/10.1007/s40473-023-00255-6>.
- [5] Bouna-Pyrrou P, Aufleger B, Braun S, Gattnar M, Kallmayer S, Wagner H, et al. Cross-sectional and longitudinal evaluation of the social network use disorder and internet gaming disorder criteria. *Front Psych* 2018;9:692. <https://doi.org/10.3389/fpsy.2018.00692>.

- [6] Andreassen CS. Online social network site addiction: a comprehensive review. *Curr Addict Rep* 2015;2:175–84. <https://doi.org/10.1007/s40429-015-0056-9>.
- [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;10:208–22. <https://doi.org/10.1556/2006.2021.00013>.
- [8] Müller A, Joshi M, Thomas TA. Excessive shopping on the internet: recent trends in compulsive buying-shopping disorder. *Curr Opin Behav Sci* 2022;44:101116. <https://doi.org/10.1016/j.cobeha.2022.101116>.
- [9] Kuss DJ, Griffiths MD. Social networking sites and addiction: ten lessons learned. *Int J Environ Res Public Health* 2017;14. <https://doi.org/10.3390/ijerph14030311>.
- [10] Wegmann E, Brand M. A narrative overview about psychosocial characteristics as risk factors of a problematic social networks use. *Curr Addict Rep* 2019;6:402–9. <https://doi.org/10.1007/s40429-019-00286-8>.
- [11] Black DW. Compulsive shopping: a review and update. *Curr Opin Psychol* 2022;46:101321. <https://doi.org/10.1016/j.copsyc.2022.101321>.
- [12] Müller A, Steins-Loeber S, Trotzke P, Vogel B, Georgiadou 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>.
- [13] Williams AD. Quality of life and psychiatric work impairment in compulsive buying: increased symptom severity as a function of acquisition behaviors. *Compr Psychiatry* 2012;53:822–8. <https://doi.org/10.1016/j.comppsy.2011.11.001>.
- [14] Huang C. A meta-analysis of the problematic social media use and mental health. *Int J Soc Psychiatry* 2022;68:12–33. <https://doi.org/10.1177/0020764020978434>.
- [15] Twenge JM, Spitzberg BH, Campbell WK. Less in-person social interaction with peers among US adolescents in the 21st century and links to loneliness. *J Soc Pers Relat* 2019;36:1892–913. <https://doi.org/10.1177/0265407519836170>.
- [16] Jeljeli R, Farhi F, Hamdi ME. The mediating role of gender in social media shopping acceptance: From the WOM perspective. *Heliyon*. 2022;8:e11065. <https://doi.org/10.1016/j.heliyon.2022.e11065>.
- [17] Abdelsalam S, Salim N, Alias RA, Husain O. Understanding online impulse buying behavior in social commerce: a systematic literature review. *IEEE Access* 2020;8:89041–58. <https://doi.org/10.1109/ACCESS.2020.2993671>.
- [18] Pellegrino A, Abe M, Shannon R. The dark side of social media: content effects on the relationship between materialism and consumption behaviors. *Front Psychol* 2022;13:870614. <https://doi.org/10.3389/fpsyg.2022.870614>.
- [19] 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;20:494–500. <https://doi.org/10.1089/cyber.2017.0162>.
- [20] Zhang Y, Trusov M, Stephen AT, Jamal Z. Online shopping and social media: friends or foes? *J Mark* 2017;81:24–41. <https://doi.org/10.1509/jm.14.0344>.
- [21] 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>.
- [22] Esmaili L, Hashemi GSA. A systematic review on social commerce. *J Strateg Mark* 2019;27:317–55. <https://doi.org/10.1080/0965254X.2017.1408672>.
- [23] Lin X, Li Y, Wang X. Social commerce research: definition, research themes and the trends. *Int J Inf Manag* 2017;37:190–201. <https://doi.org/10.1016/j.ijinfomgt.2016.06.006>.
- [24] Zhou L, Zhang P, Zimmermann H-D. Social commerce research: an integrated view. *Electron Commer Res Appl* 2013;12:61–8. <https://doi.org/10.1016/j.elerap.2013.02.003>.
- [25] Alam F, Tao M, Lahuerta-Otero E, Feifei Z. Let's buy with social commerce platforms through social media influencers: an Indian consumer perspective. *Front Psychol* 2022;13:853168. <https://doi.org/10.3389/fpsyg.2022.853168>.
- [26] Croes E, Bartels J. Young adults' motivations for following social influencers and their relationship to identification and buying behavior. *Comput Hum Behav* 2021;124:106910. <https://doi.org/10.1016/j.chb.2021.106910>.
- [27] Freberg K, Graham K, McGaughey K, Freberg LA. Who are the social media influencers? A study of public perceptions of personality. *Public Relat Rev* 2011;37:90–2. <https://doi.org/10.1016/j.pubrev.2010.11.001>.
- [28] Wu Y, Nambisan S, Xiao J, Xie K. Consumer resource integration and service innovation in social commerce: the role of social media influencers. *J Acad Market Sci* 2022;50:429–59. <https://doi.org/10.1007/s11747-022-00837-y>.
- [29] Zafar AU, Qiu J, Li Y, Wang J, Shahzad M. The impact of social media celebrities' posts and contextual interactions on impulse buying in social commerce. *Comput Hum Behav* 2021;115:106178. <https://doi.org/10.1016/j.chb.2019.106178>.
- [30] 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>.
- [31] Müller SM, Wegmann E, Garcia Arias M, Bernabeu Brotons E, Marchena Giraldez C, Brand M. Deficits in executive functions but not in decision making under risk in individuals with problematic social-network use. *Compr Psychiatry* 2021;106:152228. <https://doi.org/10.1016/j.comppsy.2021.152228>.
- [32] 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>.
- [33] 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. *Addict Biol* 2021;26:e13087. <https://doi.org/10.1111/adb.13087>.
- [34] 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>.
- [35] 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;26:334–61. <https://doi.org/10.1521/jscp.2007.26.3.334>.
- [36] Wang P, Lei L, Yu G, Li B. Social networking sites addiction and materialism among Chinese adolescents: a moderated mediation model involving depression and need to belong. *Front Psychol* 2020;11:581274. <https://doi.org/10.3389/fpsyg.2020.581274>.
- [37] Brailovskaia J, Truskauskaitė-Kunevičienė I, Kazlauskas E, Margraf J. The patterns of problematic social media use (SMU) and their relationship with online flow, life satisfaction, depression, anxiety and stress symptoms in Lithuania and in Germany. *Curr Psychol* 2021;1–12. <https://doi.org/10.1007/s12144-021-01711-w>.
- [38] Brailovskaia J, Velten J, Margaf J. Relationship between daily stress, depression symptoms, and Facebook addiction disorder in Germany and in the United States. *Cyberpsychol Behav Soc Netw* 2019;22:610–4. <https://doi.org/10.1089/cyber.2019.0165>.
- [39] Chung KL, Morshidi I, Yoong LC, Thian KN. The role of the dark tetrad and impulsivity in social media addiction: findings from Malaysia. *Pers Individ Differ* 2019;143:62–7. <https://doi.org/10.1016/j.paid.2019.02.016>.
- [40] Hou XL, Wang HZ, Hu TQ, Gentile DA, Gaskin J, Wang JL. The relationship between perceived stress and problematic social networking site use among Chinese college students. *J Behav Addict* 2019;8:306–17. <https://doi.org/10.1556/2006.8.2019.26>.
- [41] Müller KW, Wölfling K. AICA-SKI:IBS. Strukturiertes klinisches Interview zu internetbezogenen Störungen. Benutzerhandbuch. Retrieved from, [https://www.fvmedienabhaengigkeit.de/fileadmin/images/Daten/ICA-SKI\\_IBS/Explorationsleitfaden\\_AICASKI\\_IBS.pdf](https://www.fvmedienabhaengigkeit.de/fileadmin/images/Daten/ICA-SKI_IBS/Explorationsleitfaden_AICASKI_IBS.pdf); 2018. April 29, 2023.
- [42] Müller SM, Wegmann E, Oelker A, Stark R, Müller A, Montag C, et al. Assessment of criteria for specific Internet-use disorders (ACSID-11): introduction of a new screening instrument capturing ICD-11 criteria for gaming disorder and other potential Internet-use disorders. *J Behav Addict* 2022;11:427–50. <https://doi.org/10.1556/2006.2022.00013>.
- [43] WHOAssistWorkingGroup. The alcohol, smoking and substance involvement screening test (ASSIST): development, reliability and feasibility. *Addiction*. 2002; 97:1183–94. <https://doi.org/10.1046/j.1360-0443.2002.00185.x>.
- [44] Lopez-Fernandez O, Griffiths MD, Kuss DJ, Dawes C, Pontes HM, Justice L, et al. Cross-cultural validation of the compulsive internet use scale in four forms and eight languages. *Cyberpsychol Behav Soc Netw* 2019;22:451–64. <https://doi.org/10.1089/cyber.2018.0731>.
- [45] Müller A, Smits DJM, Claes L, Gefeller O, Hinze A, de Zwaan M. The German version of the Material Values Scale. *GMS Psycho Soc Med* 2013;10. <https://doi.org/10.3205/psm000095>.
- [46] Richins ML. The Material Values Scale: Measurement properties and development of a short form. *J Consum Res* 2004;31:209–19. <https://doi.org/10.1086/383436>.
- [47] Schulz P, Schlotz W, Becker P. Trierer Inventar zum chronischen stress (TICS)[Trier inventory for chronic stress (TICS)]. Hogrefe; 2004.
- [48] Petrowski K, Kliem S, Sadler M, Meuret AE, Ritz T, Brähler E. Factor structure and psychometric properties of the english version of the trier inventory for chronic stress (TICS-E). *BMC Med Res Methodol* 2018;18:18. <https://doi.org/10.1186/s12874-018-0471-4>.
- [49] Meule A, Vögele C, Kübler A. Psychometrische Evaluation der deutschen Barratt Impulsivness Scale - Kurzversion (BIS-15) [Psychometric evaluation of the German Barratt Impulsiveness Scale - short version]. *Diagnostica*. 2011;57:126–33. <https://doi.org/10.1026/0012-1924/a000042>.
- [50] Cohen J. *Statistical power analysis for the behavioral sciences* 2ed. Hillsdale, NJ: Erlbaum; 1988.
- [51] Granero R, Fernandez-Aranda F, Lara-Huallipe ML, Gomez-Pena M, Moragas L, Baenas I, et al. Latent classes for the treatment outcomes in women with gambling disorder and buying/shopping disorder. *J Clin Med* 2022;11. <https://doi.org/10.3390/jcm11133917>.
- [52] Mitchell JE, Burgard M, Faber R, Crosby RD, de Zwaan M. Cognitive behavioral therapy for compulsive buying disorder. *Behav Res Ther* 2006;44:1859–65. <https://doi.org/10.1016/j.brat.2005.12.009>.
- [53] Müller A, Arikian A, de Zwaan M, Mitchell JE. Cognitive-behavioural group therapy versus guided self-help for compulsive buying disorder: a preliminary study. *Clin Psychol Psychother* 2013;20:28–35. <https://doi.org/10.1002/cpp.773>.
- [54] Vogel B, Trotzke P, Steins-Loeber S, Schafer G, Stenger J, de Zwaan M, et al. An experimental examination of cognitive processes and response inhibition in patients seeking treatment for buying-shopping disorder. *PLoS One* 2019;14:e0212415. <https://doi.org/10.1371/journal.pone.0212415>.
- [55] Augsburger 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;9:808–17. <https://doi.org/10.1556/2006.2020.00051>.
- [56] Miltenberger RG, Redlin J, Crosby R, Stickney M, Mitchell J, Wonderlich S, et al. Direct and retrospective assessment of factors contributing to compulsive buying. *J Behav Ther Exp Psychiatry* 2003;34:1–9. [https://doi.org/10.1016/s0005-7916\(03\)00002-8](https://doi.org/10.1016/s0005-7916(03)00002-8).
- [57] 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;200:575–80. <https://doi.org/10.1016/j.psychres.2012.04.015>.
- [58] Benson AL. Amanda: an overshopper's recovery story. *J Groups Addict Recover* 2013;8:25–35. <https://doi.org/10.1080/1556035X.2013.727729>.
- [59] Brand M, Rumpf HJ, King DL, Potenza MN, Wegmann E. Clarifying terminologies in research on gaming disorder and other addictive behaviors: distinctions between core symptoms and underlying psychological processes. *Curr Opin Psychol* 2020; 36:49–54. <https://doi.org/10.1016/j.copsyc.2020.04.006>.
- [60] Castro-Calvo J, King DL, Stein DJ, Brand M, Carmi L, Chamberlain SR, et al. Expert appraisal of criteria for assessing gaming disorder: an international Delphi study. *Addiction*. 2021;116:2463–75. <https://doi.org/10.1111/add.15411>.
- [61] Billieux J, Flayelle M, Rumpf H-J, Stein DJ. High involvement versus pathological involvement in video games: a crucial distinction for ensuring the validity and utility of gaming disorder. *Curr Addict Rep* 2019;6:323–30. <https://doi.org/10.1007/s40429-019-00259-x>.
- [62] King DL, Chamberlain SR, Carragher N, Billieux J, Stein D, Mueller K, et al. Screening and assessment tools for gaming disorder: a comprehensive systematic review. *Clin Psychol Rev* 2020;77:101831. <https://doi.org/10.1016/j.cpr.2020.101831>.
- [63] Müller KW, Beutel ME, Dreier M, Wölfling K. A clinical evaluation of the DSM-5 criteria for Internet Gaming Disorder and a pilot study on their applicability to further Internet-related disorders. *J Behav Addict* 2019;8:16–24. <https://doi.org/10.1556/2006.7.2018.140>.
- [64] Brailovskaia J, Schillack H, Margraf J. Tell me why are you using social media (SM)! Relationship between reasons for use of SM, SM flow, daily stress, depression, anxiety, and addictive SM use—An exploratory investigation of young adults in Germany. *Comput Hum Behav* 2020;113:106511. <https://doi.org/10.1016/j.chb.2020.106511>.
- [65] Wegmann E, Brand M. Internet-communication disorder: it's a matter of social aspects, coping, and internet-use expectancies. *Front Psychol* 2016;7:1747. <https://doi.org/10.3389/fpsyg.2016.01747>.
- [66] Russell E, Koren G, Rieder M, Van Uum S. Hair cortisol as a biological marker of chronic stress: current status, future directions and unanswered questions. *Psychoneuroendocrinology*. 2012;37:589–601. <https://doi.org/10.1016/j.psyneuen.2011.09.009>.
- [67] Kirschbaum C, Pirke KM, Hellhammer DH. The 'Trier Social Stress Test'—a tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology*. 1993;28:76–81. <https://doi.org/10.1159/000119004>.
- [68] Montag C, Lachmann B, Herrlich M, Zweig K. Addictive features of social media/messenger platforms and freemium games against the background of psychological and economic theories. *Int J Environ Res Public Health* 2019;16. <https://doi.org/10.3390/ijerph16142612>.
- [69] Elhai JD, Yang H, Montag C. Fear of missing out (FOMO): Overview, theoretical underpinnings, and literature review on relations with severity of negative affectivity and problematic technology use. *Braz J Psychiatry* 2021;43:203–9. <https://doi.org/10.1590/1516-4446-2020-0870>.
- [70] Ostendorf S, Wegmann E, Brand M. Problematic social-networks-use in German children and adolescents - The interaction of need to belong, online self-regulative competences, and age. *Int J Environ Res Public Health* 2020;17. <https://doi.org/10.3390/ijerph17072518>.
- [71] Kim H, Schlicht R, Schardt M, Florack A. The contributions of social comparison to social network site addiction. *PloS One* 2021;16:e0257795. <https://doi.org/10.1371/journal.pone.0257795>.
- [72] Müller A, Claes L, Birlin A, Georgiadou 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;27:142–50. <https://doi.org/10.1159/000511078>.