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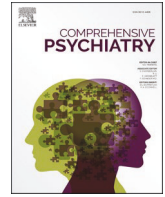


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Empirical support for recognizing pathological buying/shopping as a mental disorder

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ABSTRACT

Objective: To address the question of whether pathological buying/shopping differs from both risky and non-problematic buying/shopping.

Method: Post-hoc analysis of data collected within the Addiction Research Unit FOR2974. Three predefined groups, as determined by face-to-face diagnostic interviews, were compared: with pathological (pBSh, $n = 62$), risky (rBSh, $n = 62$), and non-problematic (control group, CG, $n = 117$) buying/shopping. Questionnaires were used to assess symptom severity (according to ICD-11 criteria for disorders due to addictive behaviors), functional impairment, craving, experience of gratification/compensation (all modified for buying/shopping), self-esteem, materialism, anxiety, depression, impulsiveness, and self-directedness. The laboratory testing included a cue reactivity paradigm and Go/No-Go affective shifting task with shopping-related cues, and standard tests for general cognitive functions (Stroop test, modified card sorting test, game of dice task, delay discounting task).

Results: The pBSh group exhibited more pathological scores in the questionnaires assessing ICD-11 criteria/features for disorders due to addictive behaviors (including distress, harm, gratification/compensation), self-esteem, anxiety, depression and steeper delay discounting than the other groups. Moreover, the pBSh group scored higher on materialism and impulsiveness, showed higher craving, and poorer performance in the Go/No-Go task than the CG. Applying Bonferroni corrected p -values, the groups did not differ in the Stroop test, modified card sorting test and game of dice task.

Conclusion: Pathological buying/shopping represents a distinct clinical syndrome that reflects underlying affective and cognitive dysfunctions and results in clinically significant distress and impairments. The findings provide further evidence of its classification as a disorder due to addictive behaviors.

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1. Introduction

1.1. Current perspectives on the classification of pathological buying/shopping

The question of whether pathological buying/shopping represents a mental disorder that warrants inclusion in the Diagnostic and Statistical Manual of Mental Disorders (DSM) [1] and the International Classification of Diseases (ICD) [2] has been the subject of considerable debate for many years [3–6]. First case reports of dysfunctional, excessive consumption of goods were published in the second half of the 19th century [7,8]. Operational criteria for the diagnosis of compulsive buying were proposed in 1994 [9] and updated in 2021 through a Delphi study involving international expert opinions [10]. The updated diagnostic criteria for pathological buying/shopping [10] align with those criteria and clinical features linked to disorders due to addictive behaviors as well as those for impulse control disorders [2]. In the ICD-11, pathological buying/shopping is currently referred to as ‘compulsive buying-shopping disorder’ (CBSD) and mentioned as an example of the residual category ‘other specified impulse control disorders’ (6C7Y) without defining clear diagnostic criteria [2]. If pathological buying/shopping is conceptualized in this manner, the corresponding ICD-11 diagnostic requirements for other specified impulse control disorder must be met: repeated failures to resist a strong impulse, drive, or urge to perform a certain activity that is rewarding for the person. In addition, the behavior should not be characterized by or fully attributable to another mental disorder [2]. The latter aspect is highly relevant, because pathological buying/shopping should not be attributable to manic episodes or obsessive-compulsive rituals. Also, the categorization of pathological buying/shopping as an impulse control disorder is controversial, as many authors see clear parallels between pathological buying/shopping and behavioral addictions [3,6,11–15]. A large group of international collaborators [11] has argued that the clinical presentation of pathological buying/shopping, as indicated by multi-methodological studies, aligns with the diagnostic criteria and clinical features of disorders due to addictive behaviors such as 1) diminished control over the behavior, 2) increasing priority given to the behavior to the extent that it takes precedence over other life interests and daily activities, and 3) continuation/escalation of the behavior despite negative consequences.

In this context, the effects of the dramatic expansion and predominant use of electronic commerce on the clinical presentation of pathological buying/shopping must be considered. Nowadays, pathological buying/shopping mainly takes place on the internet and bears similarities to other internet-related behavioral addictions, such as gaming disorder, rather than to impulse control disorders, such as pyromania, kleptomania or intermittent explosive disorder. Given the infinite product choice, easy accessibility and constant availability, problematic buying/shopping on the internet is performed frequently and for long periods of time. It encompasses not only the excessive ordering of consumer goods but also absorbing, time-consuming activities (e.g., gathering product information, placing numerous items in virtual shopping carts, extensively hunting for online price promotions) that do not necessarily result in a purchase but interfere with daily activities and responsibilities [16–18].

In addition to the aforementioned characteristics, there is one important overarching ICD-11 requirement pertaining to (almost all) mental disorders: the symptoms must lead to psychological distress and clinically significant impairment in important areas of a person's life, such as their personal, family, social, work, or academic functioning [2]. Therefore, for pathological buying/shopping to be recognized as a distinct mental disorder, studies must demonstrate that it is associated with substantial psychological distress and/or significant functional impairments. This perspective would also correspond to the harm (i.e. distress and disability) criterion, which has been identified by many authors as paramount in the definition of mental disorders [19–22].

1.2. Advantages and disadvantages of recognizing pathological buying/shopping as a mental disorder

On the one hand, recognizing pathological buying/shopping as a stand-alone mental disorder (rather than listing it as an example in the residual categories of impulse control disorders or disorders due to addictive behaviors) bears a lot of advantages. The recognition would stimulate research, enable better clinical care, and inform preventive and consumer policy strategies. On the other hand, caution is warranted to avoid the over-medicalization and erroneous stigmatization of frequent lifestyle shopping as a mental disorder or the misuse of a CBSD diagnosis to justify socially undesirable, deviant consumer behavior (e.g., fraud, deception) that is not really disordered [20,23–25].

Research should contrast pathological buying/shopping not only from inconspicuous (i.e. non-problematic) but also from subclinical (i.e. risky) buying/shopping to ensure that pathological buying/shopping deviates from both in relevant aspects (e.g., resulting distress and impairment). The majority of studies in the field of pathological buying/shopping have focused on convenience or community-based samples, or have employed correlational analyses between symptoms of pathological buying/shopping and other psychological variables using questionnaire data (for review see e.g., [3,26]). Group comparisons were published less frequently, and most of these studies used questionnaire cutoffs to define the groups (e.g., ‘probable compulsive buyers’, healthy controls), rather than diagnostic interview thresholds. Nevertheless, the literature reflects a data-driven approach, thereby establishing the basis for scoping and systematic review articles considering characteristics of pathological buying/shopping [27–30]. In the subsequent two sections, we will briefly discuss examples of previous efforts to compare pathological buying/shopping with non-problematic and risky buying/shopping.

1.3. Comparison between pathological and non-problematic buying/shopping

In terms of individual differences, there exist evidence supporting elevated material values [31,32], weaker self-esteem [33,34], more impulsiveness [35,36] and general psychopathology [37–39] in individuals with (probable) pathological buying/shopping as compared to control participants with non-problematic buying/shopping. Furthermore, a substantial body of research, albeit not exhaustive, has demonstrated group differences in affective and cognitive core processes analogous to those observed in individuals with addictive behaviors as compared to healthy controls. These discrepancies encompass phenomena associated with pathological buying/shopping such as cue reactivity and craving, reward processing, and, in some studies, also deficits in addiction-related self-control abilities (for review see [27,28,40]). Consequently, assumptions in addiction research about common characteristics (e.g., components of addiction; [41]) and shared affective and cognitive mechanisms (e.g., I-PACE model; [42,43]) have been applied to pathological buying/shopping, suggesting its classification as a behavioral addiction [11].

1.4. Comparison between pathological and risky buying/shopping

Research examining the delineation of pathological buying/shopping from risky buying/shopping is limited. This paucity may be due to the absence of standardized definitions of risky compared to pathological buying/shopping. In this regard, a consumer psychology study from the 1990s is of particular interest. The study sought to differentiate between compulsive buying clusters that are mainly driven by internal or external factors [44]. According to the authors, individuals in the internally driven cluster exhibit “true addictive buying” that is caused by their deep-seated psychological problems (e.g., anxiety, depression, elevated materialism, weak self-esteem) and results in marked distress and negative consequences. In contrast, the externally driven cluster

may manifest as a more transient, impulsive buying behavior influenced by personal circumstances (e.g., life events, advertisements, sudden desire for specific goods). The study's findings contributed to the theoretical constructs 'compulsive buying' (most comparable to pathological buying/shopping) and 'impulsive buying' (most comparable to risky buying/shopping). Notwithstanding the considerable attention that these two constructs have received in the consumer research literature, previous studies have not, to the best of our knowledge, provided a comprehensive explanation of their distinct characteristics, interactions, overlaps or transitions [45].

An alternative theoretical distinction between risky and pathological buying/shopping can be made by applying the Interaction of Person-Affect-Cognition-Execution (I-PACE) model of behavioral addictions [42]. The model differentiates between the early and later stages of the addiction process. In the early stage, a subset of the diagnostic criteria for pathological buying/shopping must be met, and individuals in this stage may be at risk for developing pathological buying/shopping. By contrast, the later stage signifies the complete manifestation of the clinical syndrome (i.e. pathological buying/shopping), wherein all diagnostic criteria should be fulfilled, encompassing distress and functional impairments due to excessive, maladaptive buying/shopping activities [43].

From a practical perspective, a number of surveys followed the 'mean plus two or one standard deviation criterion' to differentiate 'compulsive' (probable pathological) from 'compensatory' (probable risky) buying [46–49]. For example, this approach was used in a three waves representative Polish study [49] to define 'inconspicuous', 'compensatory' and 'compulsive' buying with the German Compulsive Buying Indicator (GCBI) [50]. The study found that higher materialism scores and weaker self-esteem predicted higher GCBI scores, suggesting that these variables are relevant to both 'compensatory' and 'compulsive' buying [49].

1.5. Purpose of the present study

Against this background, the present work aimed at answering the questions: 1) of whether pathological buying/shopping can be differentiated from both non-problematic as well as risky buying/shopping, which would support its recognition as a distinct mental disorder – and, if so – 2) of whether it could be classified most appropriately as an ICD-11 disorder due to addictive behaviors. Gathering evidence to support the classification of pathological buying/shopping as separate mental disorder is challenging due to the absence of an “unique and agreed-upon definition of the concept of mental disorder” [51]. We applied the ICD-11 description that mental disorders “... are syndromes characterized by clinically significant disturbance in an individual's cognition, emotional regulation, or behavior ...” [2]. In addition, we referred to the features of mental disorders as proposed by Stein, Palk and Kendler [20]. These features mainly align with the respective DSM-5 [1] and ICD-11 [2] criteria, but more strictly focus on the “psychobiological dysfunction” (instead of dysfunction in the psychological, biological, or development processes) underlying mental disorders and require the presence of “clinically significant distress or disability” in one or more important areas of functioning as a result of the mental disorder (instead of mental disorders usually being associated with distress or impairment in important areas of functioning).

To address our research questions, we compared a group with pathological buying/shopping with a group with non-problematic buying/shopping and a group with risky buying/shopping (group assignment based on diagnostic interviews) by conducting a post-hoc analysis of data collected within the two preregistered shopping-specific subprojects of the German multicenter Addiction Research Unit FOR2974 [52]. One subproject examined the role of stress responsivity on the transfer from goal-directed behavior to stimulus-response habits in a group with risky buying/shopping as compared to an age- and gender-matched group with non-problematic buying/

shopping [53]. The other subproject investigated the effects of acute stress on cue reactivity and implicit cognitions in women with pathological buying/shopping as compared to women with non-problematic buying/shopping [54]. In addition to the project-specific assessments, the comprehensive FOR2974 core battery of experimental paradigms and questionnaires was administered to all participants (for details see preregistrations; <https://osf.io/n5cd7/>, <https://osf.io/f27qw>, <https://osf.io/ehq98>). For the present study, the samples from the two subprojects were combined, yielding a final sample that comprised three subgroups with non-problematic, risky, or pathological buying/shopping.

Group comparisons were made with regard to individual characteristics, affective and cognitive functions, and symptom severity of pathological buying/shopping taking into account the ICD-11 diagnostic criteria and features for gambling disorder (6C50) and gaming disorder (6C51) [2]. In terms of individual characteristics, the present investigation concentrated on self-esteem, material values, anxiety and depression as potential predisposing factors and/or psychosocial correlates of problematic buying/shopping, as outlined in the extant literature (e.g., [26,55–61]). The outcomes can enhance our understanding of general (e.g., low self-esteem) and specific (e.g., high materialism) variables related to pathological buying/shopping.

In light of a meta-analysis [62] and recently published aggregated FOR2974 data [63] that both suggested cognitive deficits in individuals with problematic internet use, our study further addressed potential alterations in general self-control (e.g., impulsivity, decision-making, cognitive flexibility, interference susceptibility) to shed more light on potential cognitive dysfunctions related to pathological buying/shopping.

Informed by the international expert consensus on potential diagnostic criteria for CBSD [10,64] and reports on negative consequences of and impairments due to pathological buying/shopping [24,65–68], the groups were also compared with respect to the ICD-11 diagnostic criteria for disorders due to addictive behaviors. Moreover, gambling/gaming disorder ICD-11 clinical features (e.g., craving, experience of gratification and/or compensation while performing the problematic behavior) were applied to buying/shopping. The findings may support the classification of pathological buying/shopping as a behavioral addiction.

Based on current literature and theoretical considerations, four hypotheses were formulated. These hypotheses primarily targeted the comparison of pathological buying/shopping with non-problematic buying/shopping, as well as with risky buying/shopping. The comparison between risky and non-problematic buying/shopping was conducted in an exploratory manner due to the lack of research on this topic.

Hypothesis 1. Individuals with pathological buying/shopping exhibit lower self-esteem, higher material values, and more anxiety and depression symptoms than individuals with non-problematic or risky buying/shopping.

Hypothesis 2. Individuals with pathological buying/shopping show more deficits in general self-control abilities than individuals with non-problematic or risky buying/shopping.

Hypothesis 3. Individuals with pathological buying/shopping exhibit more diminished control over buying/shopping, increased priority given to buying/shopping, continuation of the problematic buying/shopping despite negative consequences, and more psychological distress and impairments in daily life due to buying/shopping than individuals with non-problematic or risky buying/shopping.

Hypothesis 4. Individuals with pathological buying/shopping show higher craving towards buying/shopping-related cues and report experiencing more gratification and more compensation while buying/shopping than individuals with non-problematic or risky buying/shopping.

2. Methods

2.1. Procedure and participants

The current sample was drawn from the German multicenter research unit FOR2974 [52]. Data were collected by multiple sites in Germany (Hannover Medical School, University of Bamberg, University of Duisburg-Essen) from October 2021 to October 2023 within the FOR2974 subprojects RP2 and RP5 (preregistered at <https://osf.io/f27qw> and <https://osf.io/ehq98>).

To be included in the study, participants were required to speak German fluently, be between 18 and 65 years old, and engage in online shopping at least occasionally. Exclusion criteria were learning or developmental disorders, psychosis, mania, current substance-use disorder (except tobacco use), acute suicidal ideations, any psychoactive substances known to interfere with performance in cognitive tasks, and more than three sessions of concurrent psychotherapy for pathological buying/shopping. If a person had already undergone psychotherapy for problematic buying/shopping, at least 12 months needed to have passed since completing the treatment. Group assignment (i.e. non-problematic, risky, pathological buying/shopping) was determined with a standardized diagnostic interview (see below) which was part of the pre-registered comprehensive FOR2974 core battery.

The initial sample included 265 individuals. Participants with technical problems, careless responding, or missing data in the behavioral tasks were listwise excluded from the analyses. The final sample consists of 241 individuals and is consistent with the ‘shopping subsample’ from the study on self-control abilities in specific types of problematic usage of the Internet [63]. The groups exhibiting pathological buying/shopping (pBSh) and risky buying/shopping (rBSh) comprised 62 individuals each, and the control group (CG) with non-problematic buying/shopping included 117 individuals (descriptives are provided in Table 2, see below). Group allocation was based on face-to-face diagnostic interviews (see below). The initial sample sizes of RP2 (see <https://osf.io/f27qw>) and RP5 (see <https://osf.io/ehq98>) were based on a priori power analyses to address the project-specific hypotheses.

The overall study protocol for the core battery testing was approved by the ethics committees of the University of Duisburg-Essen (ID: 1911APBM0457), Hannover Medical School (8767_BO_S_2019, 9025_BO_K_2020) and University of Bamberg (2019–12/13).

2.2. Related publications

A subset of the core battery findings from the entire FOR2974 cohort (i.e. using aggregated data from groups with various forms of problematic usage of the internet) on general self-control abilities [63], experience of gratification and experience of compensation [69] or cue reactivity [70] and the results pertaining to the preregistered project-specific hypotheses of the subprojects RP2 and RP5 [53,54] have previously been published. None of these publications targeted the specific research questions and hypotheses of the current post-hoc analysis. Some parts of the present findings referring to hypotheses 1 to 3 overlap with descriptive data (e.g., M , SD) in the supplementary material (i.e. Table S1: Descriptive statistics of the sample by specific type of problematic usage of the Internet) reported elsewhere [63]. Overlapping findings regarding the experiences of gratification/compensation (hypothesis 4) were reported by Wegmann et al. [69], as well as certain descriptive data regarding cue reactivity, impulsivity, or inhibitory control by Müller et al. [54] or Thomas et al. [53]. The precise sample sizes may differ between the previous and current manuscripts, except for general self-control abilities. Consequently, a re-analysis of the data relevant to each of our hypotheses was conducted. To provide readers with a consistent overview of the relevant data for our current research questions, we will report all descriptive values, even if some of them do not differ from those in the aforementioned publications.

2.3. Measures

Participants provided information on socio-demographic variables (e.g., age, gender, education, employment, partnership status). The motivation to seek treatment for problematic buying/shopping was assessed using a single question (‘Do you wish to seek treatment because of your online shopping behavior?’; 0 = ‘no’, 1 = ‘yes’, 2 = ‘already started/completed treatment’).

The *structured diagnostic interview* (i.e. Assessment of Internet and Computer Game Addiction -Strukturiertes klinisches Interview zu Internetbezogenen Störungen, AICA-SKI:IBS) [71] is based on the DSM-5 criteria for gaming disorder [1], adapted for problematic buying/shopping: (1) preoccupation, craving, (2) tolerance, (3) symptoms of withdrawal, (4) unsuccessful attempts of abstinence/loss of control, (5) loss of interests in previously enjoyed activities, (6) continued buying/shopping despite negative consequences, (7) buying/shopping to regulate emotions, (8) hiding/deception of the amount of buying/shopping, and (9) jeopardizing important relationships/future perspectives [71]. Participants in the pBSh group had to meet five or more criteria in the past 12 months, those in the rBSh group should fulfill two to four criteria, and those who fulfilled no more than one criterion were assigned to the CG. All assessors were regularly supervised by licensed senior psychotherapists with ample expertise in the field of mental disorders, including behavioral addictions (AM, SSL).

Subsequent to the AICA-SKI:IBS, six questions of the *World Health Organization Disability Assessment Schedule 2.0* (WHODAS 2.0) [72,73] adapted for problematic buying/shopping were asked to assess the degree of functioning and disability (‘In the past 30 days, how much difficulty did you have due to your use of online shopping?’). The items referred to the following areas of functioning: taking care of household responsibilities, joining in community activities, concentrating on doing something for 10 min, maintaining a friendship, day-to-day work/school, have been emotionally affected. All items were coded from 0 = ‘none’ to 4 = ‘extreme / cannot do’. Higher sum scores indicate a higher degree of impairment due to buying/shopping.

Symptoms of pathological buying/shopping regardless of the shopping environment (i.e. offline, online, mixed) were assessed with the *Pathological Buying Screener* (PBS) [74] (see supplementary material S1).

The *self-rating instruments* [32,72,73,75–83] and *neurocognitive tasks* [84–90] used to address the specific study hypotheses are listed in Table 1. Detailed descriptions of all measures are provided in the supplementary material S1. Means in the current total sample ($N = 241$) are shown in the supplementary Tables S1 and S2.

2.4. Data analysis

Analyses were conducted using SPSS v29 (IBM Corp., 2022) for Windows. Mean value (M), standard deviation (SD), and relative proportions in percentages (%) are reported where applicable. Chi-Square test statistics (χ^2) were used to investigate the association between group status and categorical study variables. For continuous variables, univariate analyses of covariance (ANCOVA) with group (CG, rBSh, pBSh) as between-subjects factor (age as covariate because of significant group differences in age, see below) and post-hoc pairwise comparisons between groups were used for group comparisons (Table 2). Quade’s nonparametric analysis of covariance (adjusted for age) was employed when the assumptions of parametric ANCOVA were violated (e.g., non-normality of dependent variable) [91] (Tables 3 and 4).

The significance level was set at 5% ($\alpha = 0.05$). Bonferroni correction for all comparisons was used to adjust p -values (i.e. 0.05 divided by number of group comparisons per hypothesis). The analyses were conducted for the total sample and subsequently for female participants only (because of significant group differences regarding gender, see below).

Table 1
Study variables and their assignment to the hypotheses.

Study variable	sr/ bt	Non-specific, generic measures	sr/ bt	Buying/shopping-specific measures ¹
HYPOTHESIS 1: INDIVIDUAL CHARACTERISTICS				
Self-esteem	sr	Rosenberg Self-Esteem Scale (RSES) [75]		
Material values	sr	Material Values Scale (MVS) [32,76]		
Anxiety, depression	sr	Brief Symptom Inventory (BSI) 'anxiety' and 'depression' subscales [77]		
HYPOTHESIS 2: GENERAL SELF-CONTROL ABILITIES				
	sr	Barratt Impulsiveness Scale (BIS-15) [78]	sr	ACSID-11 'impaired control' subscale [79]
Diminished control	sr	Temperament and Character Inventory (TCI) 'self-directedness' subscale [80,81]	sr	Self-reported average daily use time [min/d]
			bt	Go/No-Go affective shifting task [84,85]
Increased priority	bt	Stroop Color Word Interference Test (CWIT) [86,87]	sr	ACSID-11 'increased priority' subscale [79]
	bt	Modified Card Sorting Test (MCST) perseverative errors [88]	sr	ACSID-11 'continuation/escalation' subscale [79]
Continuation	bt	Game of Dice task (GDT) [89]		
	bt	Five-trial adjusting Delay Discounting Task (DD) [90]		
Distress			sr	ACSID-11 'marked distress' item [79]
			sr	ACSID-11 'functional impairment' item [79]
Impairments			sr	Six items on functional impairment adapted from the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) [72,73]
HYPOTHESIS 3: ICD-11 DIAGNOSTIC CRITERIA FOR DISORDERS DUE TO ADDICTIVE BEHAVIORS				
Craving	sr	German Craving Assessment Scale for Behavioral Addictions and Substance-use Disorders Questionnaire (CASBAS) 'reward craving', 'relief craving', 'urgency' [82]		
	bt			Cue Reactivity Paradigm (CRP) [85]
Emotion regulation	sr	Experience of Gratification Scale (EGS)/Experience of Compensation Scale (ECS) [83]		
HYPOTHESIS 4: ICD-11 CLINICAL FEATURES FOR DISORDERS DUE TO ADDICTIVE BEHAVIORS				

Note. ACSID-11 = Assessment of Criteria for Specific Internet-use Disorders. sr = self-rating/report instrument, bt = behavioral task.

¹ all questionnaires specified for buying/shopping; all behavioral tasks with buying/shopping-related stimuli.

3. Results

3.1. Sample characteristics

Table 2 presents descriptive data of the three groups with regard to demographic variables and symptoms of general pathological buying/shopping (i.e. not differentiating between offline and online). Group comparisons show significant differences in age with the pBSh group being the oldest group, followed by the CG, and the rBSh group. The pBSh group had the highest proportion of employed/working participants, and the rBSh group consisted primarily of students/apprentices. It is noteworthy that, in contrast to the other two groups, the pBSh group comprised 61 women and one non-binary person but no male participants, due to the inclusion criteria for subproject RP5 [54]. Symptoms of general pathological buying/shopping measured with the PBS [74] were highest in the pBSh group, followed by the rBSh group, and lowest in the CG. While none of the 117 participants in the CG had completed or initiated treatment, one person indicated a motivation to undergo treatment for problematic buying/shopping. In the rBSh group, 58 individuals (93.5%) reported a lack of motivation to seek therapeutic intervention for problematic buying/shopping, three individuals (4.8%) were motivated to seek treatment, and one individual (1.6%) had at least 12 months ago completed treatment. A significantly higher proportion of participants in the pBSh group as compared to the other two groups stated that they were motivated to undergo treatment (30.6%) or had already started/completed (17.7%) treatment for pathological buying/shopping (see Table 2).

3.2. Group comparison: individual characteristics

The three groups differed in individual characteristics (see Table 3). Bonferroni-corrected post-hoc tests indicated lower self-esteem, and higher anxiety and depression scores in the pBSh group than in the rBSh group and in the CG. The pBSh group scored higher on materialism than the CG but did not differ from the rBSh group. Differences between the rBSh group and the CG were found with respect to materialism and anxiety (rBSh > CG). Similar results were obtained for female participants in subsequent analyses (see Suppl. Table S3), with the exception that the pBSh and rBSh groups did not differ in self-esteem.

3.3. Group comparison: general self-control abilities

By applying a Bonferroni-corrected *p*-value of 0.008 (6 comparisons, therefore 0.05/6), the groups differed in impulsiveness, self-directedness and in the delay discounting task but not in the Stroop task, game of dice task or modified card sorting test (see Table 3). The post hoc tests indicate higher self-reported impulsiveness (BIS-11) in the pBSh group than in the CG (but not compared to the rBSh group), and lower self-directedness and worse performance in the delay discounting task than in the rBSh group and in the CG. The only difference observed between the rBSh group and the CG was detected in the delay discounting task with higher *k*-scores in the rBSh group. Female participants demonstrated a slightly divergent outcome in the post hoc group comparison of self-reported impulsiveness (BIS-11; pBSh > rBSh, CG).

3.4. Group comparison: ICD-11 diagnostic criteria for disorders due to addictive behaviors

Table 4 presents the group comparisons in terms of ICD-11 diagnostic criteria. The three groups differed gradually (i.e. pBSh > rBSh > CG) on the ACSID-11 subscales ('impaired control', 'increased priority', 'continuation/escalation', 'marked distress', 'functional impairment'), in the degree of disability due to online buying/shopping as measured with the WHODAS 2.0 items and self-reported average daily use time of online shopping apps and websites. The pBSh group exhibited diminished specific self-control as indicated by more commission errors in the

Table 2
Description of the groups.

	CG	rBSh	pBSh	Group comparison		
	n = 117	n = 62	n = 62		p	φ/Cramer's V
	n (%)	n (%)	n (%)			
Gender (male/female/diverse)						
male	14 (12.0)	12 (19.4)	–	$\chi^2_{(2)} = 9.94$	0.007	0.20
female	103 ^a (88.0)	50 ^a (80.6)	61 ^b (98.4)			
diverse/non-binary	–	–	1 (1.6)			
Native German speaker (yes)	107 (91.5)	57 (91.9)	55 (88.7)	$\chi^2_{(2)} = 0.48$	0.786	0.045
Married/Partnered (yes)	74 (63.2)	30 (48.4)	34 (54.8)	$\chi^2_{(2)} = 3.86$	0.145	0.127
School years						
≤13 year	56 (47.9)	35 (56.5)	33 (53.2)	$\chi^2_{(2)} = 1.30$	0.522	0.073
>13 years	61 (52.1)	27 (43.5)	29 (46.8)			
Job/employment						
school/university student, apprentices (1)	78 ^a (66.7)	54 ^b (87.1)	18 ^c (29.0)	$\chi^2_{(4)} = 46.86$	<0.001	0.312
part/fulltime employed/working in a job (2)	30 ^a (25.6)	6 ^b (9.7)	36 ^c (58.1)			
neither (1) nor (2) (family work, retired, other)	9 ^{a,b} (7.7)	2 ^b (3.2)	8 ^a (12.9)			
Motivation to seek treatment for problematic online buying/shopping						
no	116 ^a (99.1)	58 ^b (93.5)	32 ^c (51.6)	$\chi^2_{(2)} = 78.14$	<0.001	0.569
motivated or already started/completed treatment	1 ^a (0.9)	4 ^a (6.5)	30 ^b (48.4)			
	M (SD)	M (SD)	M (SD)	F(2,238)	p	partial η²
Age	28.26 ^a (10.64)	24.44 ^b (5.43)	32.71 ^c (12.38)	10.44	<0.001	0.081
Pathological Buying Screener	20.59 ^a (5.63)	32.02 ^b (8.30)	48.92 ^c (9.82)	282.48	<0.001	0.704

Note. CG = control group with non-problematic buying/shopping, rBSh = risky buying/shopping, pBSh = pathological buying/shopping; significant group differences are indicated by different superscripts.

neutral trial of the Go/No-Go affective shifting task than the CG ($p < .001$), but did not differ significantly from the rBSh group ($p = .118$). Applying a Bonferroni-corrected p of 0.017, the difference between the rBSh group and the CG ($p = .020$) was not considered to be significant. Subsequent analyses for the female subsamples did not reveal divergent results.

3.5. Group comparison: ICD-11 clinical features for disorders due to addictive behaviors

The groups were different in terms of clinical features (see Table 4). With regard to the experience of gratification/compensation while buying/shopping, a staircase-like group difference was again observed (pBSh > rBSh > CG). Self-reported craving, as measured by the CASBA subscales, did not differ between the pBSh and rBSh groups. However, these levels were found to be significantly higher in both groups compared to the CG. The results from the cue-reactivity paradigm for ‘arousal’ and ‘urge’ ratings show a similar pattern. On descriptive level, the CG also scored lowest on ‘valence’ (CG < rBSh, $p = .001$; CG < pBSh, $p = .014$). However, when multiple comparisons for craving were taken into account (adjusted $p < .008$), the difference between the pBSh group and the CG was no longer significant. Subsequent analyses for the female subsamples did also reveal significant overall group effects with similar results for the cue reactivity paradigm and the experience of compensation scale. On the experience of gratification scale, women in the pBSh group and the rBSh group scored higher than the CG, but not differently from each other.

4. Discussion

The present study utilized empirical data to ascertain whether pathological buying/shopping differs from non-problematic and risky buying/shopping, and whether it is justified to recognize it as a distinct mental disorder that can be classified as a behavioral addiction. Fig. 1 presents a comprehensive overview of the results. We will now discuss the outcomes, guided by our four hypotheses. The discussion will focus on the entire sample because the subsequent analyses for the female subsample did not reveal substantial differences to those from the overall sample.

4.1. Individual characteristics (hypothesis 1)

Hypothesis 1 was mainly supported by our results. Individuals with pathological buying/shopping demonstrated significant weaker self-esteem and more symptoms of anxiety and depression when compared to both the CG and the group with risky buying/shopping. The results for materialism were not as clear. As expected, the group with pathological buying/shopping showed stronger materialistic values than the CG, but did not differ significantly from the group with risky use. This finding underscores the pivotal role of high material value orientation as a specific predisposing factor for pathological buying/shopping [30,58,92]. While symptoms of anxiety and/or depression can be considered general psychopathological vulnerabilities or psychopathological correlates for a broad range of mental health disorders [93–95], materialism specifically predicts pathological buying/shopping that

Table 3
Group comparisons of individual characteristics and general self-control abilities.

	sr/bt	CG (n = 117)	rBSh (n = 62)	pBSh (n = 62)	Comparison ¹		
		M (SD) Min / Max	M (SD) Min / Max	M (SD) Min / Max	F(2,237)	p	partial η^2
INDIVIDUAL CHARACTERISTICS²							
Rosenberg Self-Esteem Scale	sr	22.23 ^a (5.61) 2.00 / 30.00	20.73 ^a (5.31) 8.00 / 29.00	17.50 ^b (7.35) 5.00 / 30.00	10.87	<0.001	0.084
Material Values Scale	sr	36.61 ^a (9.75) 16.00 / 62.00	42.92 ^b (11.19) 20.00 / 74.00	45.02 ^b (10.67) 22.00 / 69.00	18.23	<0.001	0.133
BSI Anxiety	sr	0.47 ^a (0.39) 0 / 2.17	0.66 ^b (0.57) 0 / 2.50	0.96 ^c (0.67) 0 / 3.17	18.65	<0.001	0.135
BSI Depression	sr	0.49 ^a (0.64) 0 / 3.80	0.71 ^a (0.70) 0 / 3.20	1.27 ^b (1.00) 0 / 4.00	21.75	<0.001	0.155
GENERAL SELF-CONTROL ABILITIES³							
Barratt Impulsiveness Scale	sr	29.88 ^a (5.57) 20.00 / 46.00	31.53 ^{a,b} (6.23) 18.00 / 45.00	35.50 ^b (7.21) 20.00 / 52.00	13.74	<0.001	0.104
TCI Self Directedness	sr	33.74 ^a (6.35) 12.00 / 44.00	31.76 ^a (7.10) 17.00 / 43.00	26.92 ^b (8.12) 9.00 / 39.00	17.98	<0.001	0.131
Stroop Color Word Interference Test, time [sec]	bt	64.92 (12.82) 35 / 131	65.63 (13.94) 36 / 124	73.35 (18.23) 45 / 127	3.41	0.035	0.028
Delay Discounting Task, log(k)	bt	-6.90 ^a (1.70) -9.12 / 3.18	-6.29 ^b (1.39) -9.12 / -3.76	-4.63 ^c (2.31) -8.59 / 3.18	31.93	<0.001	0.212
Game of Dice task, net score	bt	11.61 (7.46) -18.00 / 18.00	10.00 (8.86) -16.00 / 18.00	8.89 (8.26) -18.00 / 18.00	3.23	0.041	0.026
MCST, perseverative errors	bt	2.44 (2.71) 0 / 10.00	2.13 (2.54) 0 / 9.00	3.08 (3.27) 0 / 12.00	0.36	0.696	0.003

Note. CG = control group, rBSh = risky buying/shopping, pBSh = pathological buying/shopping; sr = self-rating/report instrument, bt = behavioral task; BSI = Brief Symptom Inventory, BIS = Barratt Impulsiveness Scale, TCI = Temperament and Character Inventory. MCST = Modified Card Sorting Test. M(SD) are unadjusted values. ¹Quade nonparametric ANCOVAS (adjusted for age). Bonferroni-adjusted significance levels: ².012 (0.05/4), ³.008 (0.05/6). Overall group comparisons that are significant at the Bonferroni-adjusted significance level are highlighted in bold font. Bonferroni-adjusted significant post-hoc tests are indicated by different superscripts.

becomes apparent in the early stage of addiction [43,96,97]. Pathological buying/shopping may develop particularly in individuals with high material values endorsement who attempt to compensate for self-esteem problems by repeatedly acquiring material possessions [58,98,99]. In addition, the interaction of materialism and self-control could be an important mechanism. For individuals with high materialism, an adequate degree of self-control may prevent the transition from risky to clinically relevant, pathological buying/shopping.

Our result could be further explained by potentially different trajectories of material value orientation, self-esteem and general psychopathology during the development of pathological buying/shopping. When considering materialism as a trait-like variable [100], one might posit that it does not change substantially from early to later stages of pathological buying/shopping. In contrast, self-esteem, anxiety, and depressive symptoms may worsen in later stages of pathological buying/shopping as a result of negative consequences such as distress, debts and familial conflicts [101]. However, this assumption cannot be proven based on the comparative cross-sectional data.

4.2. General self-control abilities (hypothesis 2)

Hypothesis 2 was partially supported by our findings. The questionnaire data indicate lower self-directedness (i.e. reduced ability to be responsible, resourceful, and goal-oriented) [80] in the group with pathological buying/shopping as compared to both the CG and the rBSh group. Trait impulsivity in the sense of rapid, unplanned actions regardless of possible negative consequences [78] was higher in the

group with pathological buying/shopping than in the CG, but did not differ between the pBSh and rBSh groups. Overall, the findings are in accordance with the literature (e.g., [35,36,60,102,103]). Following on from the discussion on materialism, they suggest that general impulsiveness constitutes another vulnerability factor for pathological buying/shopping that is present in the early stages of the addictive process [43].

In line with the core battery findings from the entire FOR2974 cohort (N = 1119) [63], there appeared to be overall group effects in the delay discounting task, Stroop task and the game of dice task but not in the modified card sorting test. However, when multiple comparisons were taken into account (applying a Bonferroni corrected p-value), the overall group differences in the Stroop task and game of dice task no longer proved to be statistically significant. This finding indicates a lack of group differences in the behavioral tasks utilized to assess general executive functions such as rule detection abilities, feedback processing or cognitive flexibility, general interference control abilities, and risky decision making. The outcome is consistent with previous studies that employed these tasks and did not find significant differences between patients with pathological buying/shopping (not differentiating between offline and online) and healthy control participants [36,104,105]. However, they are in contrast to the findings of a meta-analysis on neurocognitive deficits in problematic usage of the internet that did not include studies on problematic online shopping [62]. This outcome suggests that pathological buying/shopping may be considered distinct from other behavioral addictions or alternative forms of problematic usage of the internet, as also reported previously when compared several

Table 4
Group comparisons of ICD-11 criteria and clinical features.

	sr/bt	CG (n = 117)	rBSh (n = 62)	pBSh (n = 62)	Group comparison ¹		
		M (SD) Min / Max	M (SD) Min / Max	M (SD) Min / Max	F(2,237)	p	partial η ²
DIAGNOSTIC CRITERIA							
Diminished control²							
ACSID-11 'impaired control'	sr	1.70 ^a (2.14) 0 / 9.00	5.03 ^b (2.28) 0 / 9.00	7.45 ^c (1.48) 5.00 / 9.00	161.73	<0.001	0.576
Self-reported average daily use time [min/d]	sr	25.99 ^a (27.80) 0 / 135.00	67.94 ^b (39.43) 10.00 / 165.00	151.05 ^c (78.85) 12.50 / 450.00	142.50	<0.001	0.545
Go/No-Go affective shifting task, commission errors in neutral trial	bt	7.00 ^a (4.13) 0 / 18.00	8.55 ^{a,b} (4.88) 1.00 / 22.00	9.26 ^b (3.55) 3.00 / 19.00	8.98	<0.001	0.070
Increased priority							
ACSID-11 'increased priority'	sr	0.61 ^a (1.39) 0 / 9.00	2.50 ^b (2.16) 0 / 9.00	5.21 ^c (2.81) 0 / 9.00	107.99	<0.001	0.476
Continuation							
ACSID-11 'continuation/escalation'	sr	0.25 ^a (1.08) 0 / 9.00	1.14 ^b (1.45) 0 / 5.00	3.73 ^c (2.73) 0 / 9.00	97.14	<0.001	0.449
Distress, Impairment²							
ACSID-11 'marked distress'	sr	0.21 ^a (0.59) 0 / 3	0.61 ^b (0.75) 0 / 2	2.16 ^c (0.89) 0 / 3	137.17	<0.001	0.535
ACSID-11 'functional impairment'	sr	0.18 ^a (0.53) 0 / 3	0.79 ^b (0.85) 0 / 3	2.10 ^c (1.04) 0 / 3	117.46	<0.001	0.497
WHODAS 2.0	sr	0.51 ^a (1.33) 0 / 7	3.34 ^b (2.94) 0 / 13	8.19 ^c (5.05) 0 / 21	175.87	0.001	0.596
CLINICAL FEATURES							
Craving³							
CASBA 'reward craving'	sr	0.80 ^a (1.09) 0 / 4.00	2.39 ^b (1.17) 0 / 4.50	2.49 ^b (1.71) 0 / 5.00	52.29	<0.001	0.305
CASBA 'relief craving'	sr	0.44 ^a (0.79) 0 / 4.00	1.68 ^b (1.24) 0 / 4.50	1.60 ^b (1.71) 0 / 5.00	48.18	<0.001	0.288
CASBA 'urgency'	sr	0.07 ^a (0.26) 0 / 1.50	0.45 ^b (0.58) 0 / 2.50	0.93 ^b (1.28) 0 / 5.00	35.55	<0.001	0.230
CRP 'arousal'	bt	1.52 ^a (0.73) 0.50 / 3.63	2.40 ^b (0.68) 0.80 / 3.79	2.57 ^b (1.15) 0.50 / 4.67	38.60	<0.001	0.250
CRP 'urge'	bt	1.38 ^a (0.70) 0.50 / 3.54	2.36 ^b (0.71) 1.00 / 3.88	2.50 ^b (1.12) 0.50 / 4.67	47.58	<0.001	0.291
CRP 'valence'	bt	2.50 ^a (0.83) 0.50 / 3.63	3.03 ^b (0.54) 1.40 / 3.96	2.75 ^a (1.07) 0.50 / 5.00	7.13	0.001	0.058
Emotion regulation⁴							
Experience of Gratification Questionnaire	sr	1.34 ^a (0.62) 0 / 3.00	1.98 ^b (0.66) 0.33 / 3.50	2.30 ^c (0.72) 0 / 3.67	51.92	<0.001	0.304
Experience of Compensation Questionnaire	sr	0.42 ^a (0.59) 0 / 2.67	1.28 ^b (0.88) 0 / 3.00	1.95 ^c (0.96) 0 / 4.00	85.53	<0.001	0.418

Note. CG = control group, rBSh = risky buying/shopping, pBSh = pathological buying/shopping; sr = self-rating/report instrument, adopted for buying/shopping, bt = behavioral task with buying/shopping-repeated stimuli; ACSID = Assessment of Criteria for Specific Internet-use Disorders, WHODAS = World Health Organization Disability Assessment Schedule, CASBA = Craving Assessment Scale for Behavioral Addictions, CRP = cue-reactivity paradigm.

M(SD) are unadjusted values. ¹Quade nonparametric ANCOVAS (adjusted for age).

Bonferroni-adjusted significance levels: ².017 (0.05/3), ³.008 (0.05/6), ⁴.025 (0.05/2). All overall group comparisons are significant at the Bonferroni-adjusted significance level and highlighted in bold font. Bonferroni-adjusted significant post-hoc tests are indicated by different superscripts.

⁵ CRP: n = 115 in the CG, n = 60 in the rBSh-group, n = 60 in the pBSh-group.

mental disorders, including pathological buying/shopping, on general psychopathology and personality traits [106].

Interestingly, the results of the delay discounting task constitute an exception to this pattern. This is in line with a meta-analysis that in case-

control comparisons found steeper delay discounting in individuals with problematic usage of the internet [107] and supports findings from a web-based convenience sample regarding an association between symptoms of pathological buying/shopping and steeper discounting

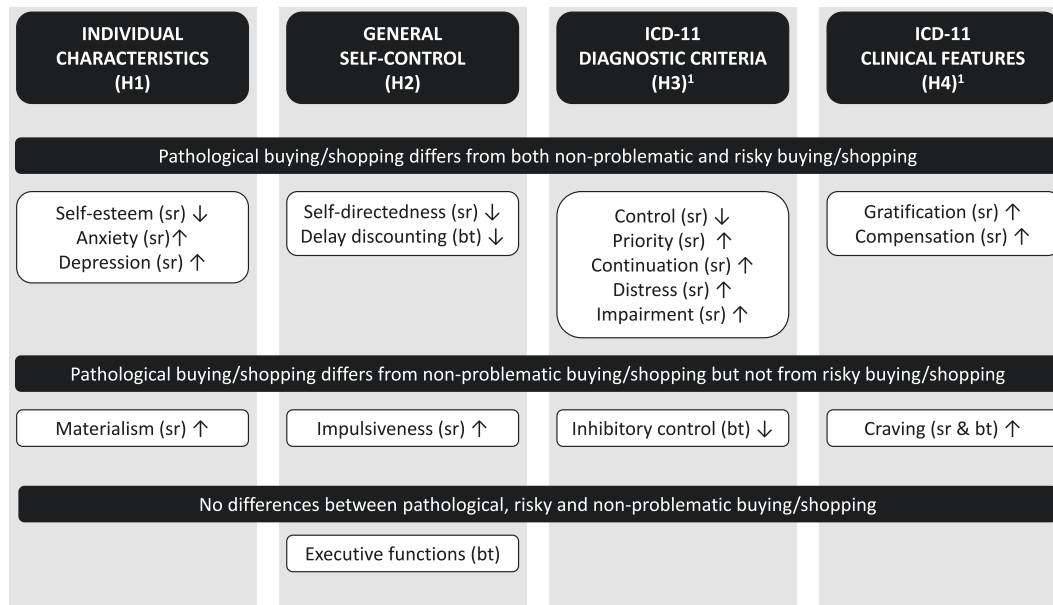


Fig. 1. Summary of the results.

functions [108]. Previous studies conducted on gambling disorder have also demonstrated a significant association between the severity of the disorder and the delay discounting rate [109]. The high magnitude of the effect in our study aligns with the staircase-like differences between the three groups (steeper discounting: pBSh > rBSh > CG) and points to the recognition of pathological buying/shopping as a distinct mental disorder which could be classified as a disorder due to addictive behaviors. The discrepancy between these findings and those from the other behavioral measures could be explained by the fact that the delay discounting task targets not only general but also shopping-specific aspects (i.e. monetary reward). For most consumers, money is associated with positive and negative emotions (e.g., pleasure, anxiety), symbolic meanings (e.g., reflecting competence, power, success, status, prestige), and beliefs (e.g., money as problem solver or happiness guarantee) that go far beyond the use of money in solely instrumental terms [110,111]. Several studies suggest that money attitudes shape consumers' values, affect their consumption of material goods, including nonessentials, and can thus contribute to pathological buying/shopping [33,112,113]. Given that the delay discounting task may tap into buying/shopping-specific processes - and that thinking about money may trigger buying/shopping - its use and interpretation as an appropriate measure for general executive functions in samples with problematic buying/shopping might be challenging. The same could be said of the game of dice task [89], where participants bet on the potential monetary gains and losses associated with the toss of a dice. In contrast, the delay discounting task is oriented towards positive outcomes, specifically the preference for smaller, immediate monetary rewards over larger, delayed rewards and is likely to be particularly appealing to individuals with pathological buying/shopping.

4.3. ICD-11 diagnostic criteria for disorders due to addictive behaviors (hypothesis 3)

The self-report data (ACSID-11, WHODAS 2.0) support the classification of pathological buying/shopping as a disorder due to addictive behaviors. The findings on the presence of clinically significant distress and impairments in daily life due to buying/shopping are of particular relevance. The pBSh group exhibited the highest levels of distress/impairment, followed by the rBSh group, while the CG demonstrated minimal levels. It is crucial to highlight that the ACSID-11 and WHODAS items were not formulated in general terms. Instead, they were designed

specifically to assess shopping-related distress and impairment (e.g., ACSID-11: 'Thinking about all areas of your life, did buying/shopping cause you suffer in the past 12 months?') in order to distinguish it from distress and impairment caused by other problems. In accordance with the harm criterion, which many authors have identified as essential to conceptualizing a mental disorder [19–22], this pattern of group differences clearly underscores the clinical relevance of pathological buying/shopping as a mental disorder. It should be noted critically that symptoms of pathological buying/shopping and the resulting harm were assessed during the structured interview, and the group assignment was based on these results. In this respect, the ACSID-11 and WHODAS results are not entirely surprising. Nevertheless, the group differences in the extent of general problematic buying/shopping, as measured using the PBS [74], along with differences in self-reported average daily use time and treatment motivation, all support the aforementioned interpretation.

The pBSh group reported spending more time on average each day on shopping websites and applications than the groups with non-problematic or risky buying/shopping. The substantial variability in self-reported usage time across all three groups is noteworthy. This variability supports the idea that the duration of internet usage alone is not a reliable indicator of a potential problematic online behavior. Every second person in the group with pathological buying/shopping was either motivated to seek treatment, or had already started psychotherapy, or completed it more than a year ago. While this proportion is considerably higher than that observed in the group with risky buying/shopping, it is nevertheless relatively modest when considering the massive negative consequences and impairments associated with problematic buying/shopping. The observation that nearly half of the pBSh group did not intend to seek treatment may be indicative of the ego-syntonic facets (e.g., pleasurable experiences or emotional relief while shopping; see also the discussion below regarding hypothesis 4) rather than purely distressing (e.g., familial conflicts, debts) aspects of pathological buying/shopping in some individuals. However, the reasons for a lack of motivation to undergo therapy could also lie in shame about inappropriate overspending, or in limited insight and underestimation of its negative consequences [114]. Finally, the failure to recognize pathological buying/shopping as a mental disorder, in conjunction with the paucity of disorder-specific therapeutic services — at least within the German context — may have contributed to the finding [115]. Surprisingly, one individual within the CG expressed the motivation to seek

treatment for buying/shopping, which could be a sign of an underlying problem. Therefore, we checked the raw data from this person again. However, the results of the diagnostic interview, the PBS, the ACSID-11, WHODAS 2.0 and other questionnaires and tests did not reveal any problematic scores.

The outcome of the Go/No-Go affective shifting task, which utilized visual stimuli related to buying/shopping versus neutral stimuli, corresponds with the ACSID-11 'diminished control' result and with the findings from the collapsed FOR2974 cohort [63]. We found a reduced ability to inhibit responses to buying/shopping-related pictures in individuals with pathological buying/shopping compared to individuals with non-problematic buying/shopping and on a descriptive level also between the groups with risky and non-problematic buying/shopping.

4.4. ICD-11 Clinical features for disorders due to addictive behaviors (hypothesis 4)

The clear group differences in experiences of both gratification and compensation while buying/shopping (large effect sizes; pBSh > rBSh > CG) support our *hypothesis 4* and are in line with the results from the aggregated FOR2974 sample ($N = 834$) published by Wegmann et al. [69]. The findings indicate that individuals in the pBSh group reported using buying/shopping to gratify specific needs or compensate negative feelings or unsatisfied needs more often than individuals with non-problematic or risky buying/shopping. This result fits with the assumption of a 'feels-better path' with positive (e.g., pleasure) and negative reinforcement (e.g., stress relief) as an assumed key mechanism of problematic usage of the internet [116]. Positive reinforcement processes seem to be relevant not only in the early stage (i.e. when risky buying/shopping is developing) but also in the later stage of the addictive process [43,69]. This result supports the recognition of pathological buying/shopping as a behavioral addiction and has clinical implications.

Patients usually seek treatment when they exhibit significant distress due to their shopping activities and when the immense negative consequences become too painful to ignore or deal with. At this stage, they most frequently describe maladaptive shopping as a seemingly habitual or compulsive 'must-do' coping with negative affective states. Goal-directed 'feel-better' [116] aspects of pathological buying/shopping (e.g., to achieve pleasure or alleviate discomfort) may be neglected, not recognized while shopping, reframed or not mentioned by the patients because of denial, shame and feelings of guilt about the long-lasting inappropriate, excessive purchases. As with other addictive behaviors [117], in the diagnostic and therapeutic management of individuals with pathological buying/shopping, it is important to encourage reflection on both the habit-like or compulsive as well as the enduring goal-directed (and rewarding) aspects of pathological buying/shopping.

The pBSh group reported higher craving for online shopping than the CG, but the results do not suggest a significant difference between risky and pathological use (*hypothesis 4* partly supported). This outcome aligns with the results from a larger FOR2974 sample ($N = 536$) suggesting heightened cue reactivity in individuals with risky or pathological use as compared to control participants with non-problematic use [70]. It appears that craving does not discriminate between risky and pathological buying/shopping which may be seen as an argument for not including craving as a diagnostic requirement in the ICD-11. The dynamic interaction between affective responses to shopping stimuli and self-control abilities may influence an individual's propensity to engage in either risky (still sufficient self-control) or pathological (reduced self-control) use [43]. Our ACSID-11 subscale 'diminished control' findings and performance in the delay discounting task provide support for this assumption.

4.5. Clinical implications

The results of this study have implications for clinical care as well as

for psychotherapy research, some of which will be outlined here by way of example. As mentioned above, clinicians should consider that pathological buying/shopping encompasses both compensatory and gratificatory aspects, even in its later stages. By applying the experimental medicine approach [118], the findings may inform proof-of-concept studies that address certain psychological processes and mechanisms in pathological buying/shopping (e.g., cue reactivity) [119]. Such studies can facilitate a more profound comprehension of the manner in which specific interventions (e.g., cue exposure training) could augment existing psychotherapy for pathological buying/shopping (e.g., cognitive behavioral therapy) [115,120] and contribute to better treatment outcomes.

Another consideration targets the role of materialism in risky and pathological buying/shopping. It is essential to address materialistic value and goal orientation as early as possible, ideally before the manifestation of clinically relevant pathological buying/shopping behaviors. Coping strategies for high materialism should be incorporated into preventive programs for pathological buying/shopping [121,122].

From a broader perspective, the findings could contribute to pathological buying/shopping being recognized as a mental disorder. This would expand the existing care infrastructure for affected individuals by legitimizing pathological buying/shopping within clinical practice and health insurance systems and stimulate discussions about suitable consumer policy strategies.

4.6. Advantages and limitations

This study is the first that compared a broad range of self-report instruments and behavioral tasks across well-defined groups with varying degrees of problematic online buying/shopping, including the entire continuum from non-problematic, through risky, to pathological buying/shopping behavior. The findings extend the literature not only with respect to the comprehensive assessment battery but also with regard to the comparison of pathological buying/shopping with risky buying/shopping. Despite the ubiquity of the e-commerce market in everyday life, the emphasis on online buying/shopping in our study may limit the interpretations. Another potential concern pertains to the secondary analyses of data related to predefined sample sizes, unequal gender distribution across the three groups, and to a predefined set of data. However, this approach enabled us to address very specific conceptual research questions and increase the value of the completed FOR2974 data collection.

5. Conclusions

A specific pattern of findings emerged, in which individuals with pathological buying/shopping exhibited higher levels of shopping-specific and general pathology in the questionnaires and poorer performance in tests utilizing shopping-specific or purchase-related stimuli than individuals with non-problematic buying/shopping. A largely similar picture was found when comparing pathological with risky buying/shopping, except for materialism, trait impulsivity, and craving. These variables contribute to both pathological buying/shopping as well as risky buying/shopping. Although contrasting risky buying/shopping from non-problematic buying/shopping was not the focus of our study, it seems interesting that the present findings indicate a pronounced materialistic orientation, more symptoms of anxiety, and a stronger preference for smaller, sooner virtual monetary rewards over larger, later ones in the rBSh group than the CG.

Overall, the outcomes can be interpreted in the way that risky buying/shopping constitutes an early stage of pathological buying/shopping development [43]. Along with the group differences in the ICD-11 diagnostic criteria and clinical features, the results further suggest that pathological buying/shopping is a distinct clinical syndrome that can be most appropriately categorized as a disorder due to addictive behaviors.

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CRediT authorship contribution statement

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