Buying-shopping disorder, emotion dysregulation, coping and materialism: a comparative approach with gambling patients and young people and adolescents

Ana Estévez[a], Paula Jauregui[a], Roser Granero[b,c], Lucero Munguía[d,e] , Hibai López-González[a,e], Laura Macía[a], Naiara López[a], Janire Momeñe[a], Susana Corral[a] , Fernando Fernández-Aranda[c,d,e,f] , Zaida Agüuera[c,e,f,g], Teresa Mena-Moreno[c,e,f], Maria del Espino Lozano-Madrid[c,e,f], Cristina Vintró-Alcaraz[c,e,f], Amparo del Pino-Gutierrez[c,e,f,g], Ester Codina[e], Eduardo Valenciano-Mendoza[e], Mónica Gómez-Peña[e], Laura Moragas[e], Gemma Casalé[e], Bernat Mora-Maltas[e], Gemma Mestre-Bach[e,h], José M. Menchón[d,e,f,i] and
Susana Jiménez-Murcia[c,d,e,f]

a Psychology Department, University of Deusto, Bilbao, Spain;
b Departament de Psicobiologia i Metodologia, Universitat Autónoma de Barcelona, Barcelona, Spain;
c Ciber Fisiopatologia Obesidad y Nutrici_on (CIBERobn), Instituto Salud Carlos III, Barcelona, Spain;
d Department of Clinical Sciences, School of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain;
e Department of Psychiatry, Bellvitge University Hospital-IDIBELL, Barcelona, Spain;
f Psychiatry and Mental Health Group, Neuroscience Program, Institut d'Investigació Biomédica de Bellvitge - IDIBELL, L'Hospitalet de Llobregat, Barcelona, Spain;
g Departament d'Infermeria de Salut Pública, Salut Mental i Maternoinfantil. Escola Universit_aria d'Infermeria. Universitat de Barcelona, Barcelona, Spain;
h International University of La Rioja, Logroño, La Rioja, Spain;
i Ciber Salud Mental (CIBERSAM), Instituto de Salud Carlos III, Barcelona, Spain

Abstract

Objective: The comorbidity between gambling disorder (GD) and buying-shopping disorder (BSD) has led to explore the core features that could be interacting between them. The main aim of this study was to examine the differences in both conditions considering emotion dysregulation, coping and materialism, as well as the relationship between these variables and their interaction with age and sex.
Methods: A community sample (n¼281 adolescents) and a sample of individuals with GD (n¼31) was compared. Both samples were split into a group with BSD and a group without it.
Results: The prevalence of participants who met the criteria for BSD was higher in the GD sample than in the community sample; the GD sample also presented higher values in the psychological variables studied. In the community sample group, positive associations were found between BSD severity and materialism and emotion dysregulation levels. In the GD sample, BSD severity was higher for participants who reported higher levels in materialism and lower scores in coping strategies. Variables impacted BSD severity differently according to sex and age covariates.
Conclusions: The results of the interaction of the variables could be useful to design prevention and treatment approaches addressed to specific groups of age and sex..

Key words: Gambling, Buying-shopping disorder, Emotion dysregulation, Coping, Materialism

Key points

- Buying-shopping disorder (BSD) has been compared in clinical and community samples.
- The clinical sample was constituted by Gambling disorder (GD) patients.
- The variables emotion dysregulation, coping and materialism have been considered.
- Variables impacted BSD severity differently according to sex and age covariates

1. Introduction

Buying-shopping disorder (BSD) is characterized by a persistent presence of buying-related impulses, worries, and maladaptive behaviours, which are regarded as intrusive and irresistible, and generating discomfort to the individual and to the people around them [1]. In addition, the buying episodes tend to last longer and to take place more frequently than originally planned and result, on most occasions, in the purchasing of items that the individual does not need [2].

Recent epidemiological studies alert that BSD has increased worldwide in the past two decades. According to the studies conducted by [1], the prevalence of such disorder in the general population is between 1 per cent and 11.3 per cent. Research suggests that the prevalence rates tend to be higher both in younger individuals and in clinical populations, ranging from 1%-30% depending on the origin of the sample [3]. In the same fashion, several studies point out to the heightened prevalence of impulsive buying both online and offline in younger ages [4,5]. In pathological gamblers with comorbid BSD, the onset is usually at a later stage, being the presence of such comorbidity at younger ages associated with a more severe profile [3,6]. In relation to gender, there are some mixed findings in the literature regarding prevalence, as some studies indicate higher prevalence rates in females (80 per cent) while other studies have found similar prevalence rates in both sexes [2]. However, there is clear evidence that in clinical populations with BSD and comorbid pathological gambling the highest prevalence would be for males [7]. On the other hand, the profiles of female and male BSD might differ, as males tend to show lower levels of reward dependence and higher levels of psychiatric comorbidity (for instance, GD, sex addiction, and intermittent explosive disorder), whereas females would cluster in two separate profiles as a function of their personality characteristics, the age of onset, and the comorbid symptomatology [3].

There is some evidence of the comorbidity between pathological gambling and BSD in clinical populations [8]. Both disorders have some common characteristics, such as an early onset of the addictive behaviours and the presence of materialistic values [9]. The profile of the individuals with a GD and a comorbid BSD would be characterized by an increased psychopathology and dysfunctional levels of harm avoidance [6]. In the same vein as in the GD, some of the factors that might be involved in BSD are associated with coping skills and emotion regulation [10]. Coping is defined as “conscious volitional efforts to regulate emotion, cognition, behaviour, physiology, and the environment in response to

stressful events or circumstances" [11], whereas emotion regulation is regarded as the process by which individuals modify the kind of emotions they have, when they have them and how they manage and express such emotions [12,13], being these two processes key to a healthy adjustment of the individual. However, the people who have behavioural addictions, and specifically, buying-related addictive behaviours, show difficulties in regulating their emotions and therefore struggle to give appropriate responses when facing stressful situations [14]. Consequently, they have difficulties in minimising the maladaptive emotional reactions, managing negative moods in an appropriate manner, and in maximizing the positive ones [15].

In this sense, there is evidences that that the way an individual regulates her or his emotions is associated with difficulties in impulse control [16], being this lack of control one of the most prominent features of pathological gambling and BSD [14]. Individuals who show high levels of impulsivity when purchasing items, as in the case of compulsive buyers, tend to have limited reflective thinking and to be very emotionally attracted to perform this behavior and to the immediate rewards associated with the purchase [17]. Furthermore, these individuals are prone to be guided by behaviours that lead to a reward, either internal or external, with the purpose of gaining some social recognition or for their personal enhancement [18]. Consequently, those individuals who display BSD would fare higher on materialism, valuing material possessions as a way to enhance the self, and to judge one's and others' success accordingly [19,20]. Similarly, another comprehensive study explored the link between materialism and self-esteem, highlighting a negative relationship between these two constructs [21]. Following these findings, defining oneself in terms of one's material possessions, closely linked to the perception that one does not possess enough goods (i.e., materialistic values), leads to a significant decrease in self-esteem, which is, in turn, overcompensated by increasing the dysfunctional buying behaviours, leading eventually to what has been defined as BSD [21]. Different studies have pointed out the salience of materialism in younger ages, as students with substance misuse are prone to believe that happiness is brought about by material possessions [22]. These findings align well with studies which point out that the adolescence is an important a life stage for the development of one's own identity, thus the predominance of materialistic values at young ages might be a risk factor for the development of dysfunctional buying behaviours in adulthood [23].

Overall, the main aim of the present research was to explore the differences in BSD, coping, emotion regulation, materialism, age and gender between two samples, namely, one

community sample and a second sample with treatment-seeking individuals with GD. A second aim was to examine the relationship between BSD and coping skills, emotion regulation and materialism in both samples, as well as their interaction with age and gender.

2. Methods

2.1 Participants

The sample comprised 281 young people and adolescents. An initial sub-sample of 250 participants was recruited from secondary education high schools. A second sub-sample consisted of 31 individuals diagnosed with GD from a hospital unit specialised in behavioral addictions. Both samples were split into two groups, one where BSD was present and another where BSD was lacking..

2.2Measures

Buying-shopping disorder. The *Pathological Buying Scale* (PBS) was used [24]. Spanish validation by Fernández-Aranda, et. al., 2019 [25]. It is a 13-item scale that assesses symptoms of BSD, considering both impulse control and addictive features of excessive buying behaviour, as well as items to measure craving and loss of control. The internal consistency in the Spanish validation was excellent for the two factors (α = .92 for EBB and .86, for LCC), the internal consistency of this study is reported in Table S1 (supplementary material), and corresponds to good values as well.

Materialism. *Materialism Values Scale* (MVS) [20]. In this study, the Spanish adaptation by Lado and Villanueva (1998) [26] was used. This scale has 18 items, which assess materialistic values, with an overall score and three subscales, which measure importance, success, and happiness based on materialism, following the conceptualization proposed by Richins and Dawson [20]. Items use a four-point Likert scale ranging from 0 (= *completely disagree*) to 3 (= *completely agree*). The Spanish scale has an adequate internal consistency, with a Cronbach's alpha coefficient of .89 for the overall scale, and coefficients of .77 and .83 for the subscales. The Cronbach's alpha coefficients of the present study ranged between 0.70 to 0.82 (see Table S1).

Coping. *Coping Strategies Inventory* (CSI) [27]. Translated and validated into Spanish by Cano, Rodríguez, and García [28]. The original scale comprised 72 items that can be self-administered. The Spanish adaptation reduced the original scale to 40, removing those items that show less factor loading, and added a measure of perceived self-efficacy in coping. The scale consists of eight 5-item subscales, with scores from 0 (*not at all*) to 4 (*totally*). The

instrument has a hierarchical structure, composed of eight primary subscales, four secondary subscales and two tertiary subscales.

The CSI shows good psychometric properties, with Cronbach's alphas ranging from .75 to .89 in the eight primary subscales of the Spanish validation. In the present study, reliability was between .75 and .91 (see Table S1).

Emotion regulation. *The Difficulties in Emotion Regulation Scale* (DERS) [29]; Spanish validation by Wolz et.al. 2015 [30] was used. The measure comprises 36 items that gauge a number of obstacles concerning optimal emotion regulation. Each item is evaluated on a 5-point Likert scale ranging from '*Almost never'* (0-10% of the time) to *'Almost always'* (90-100% of the time). The previously reported psychometric properties of the instrument are excellent (Cronbach's alpha of .93; range=.73–.91, with a test-retest reliability of .88 in a 4-8-week period). The internal consistency of this measure in the sample of the study ranged from 0.79 to 0.91 (see Table S1), and indicates good reliability.

2.3 Procedure

The recruitment of participants entailed two separate procedures. First, community population was recruited from secondary education institutions from the Basque Country region in Spain following a convenience sampling. Several invitations were sent out to institutions, and in those which accepted the invitation to participate, a research team member administer a paper-and-pencil questionnaire in person. Students completed the survey in their classroom individually. The survey included general information concerning the study purposes. Regarding the clinical sample, participants were recruited from the Behavioural Addictions Unit at Bellvitge University Hospital, in Barcelona, Spain. All patients were diagnosed according to the DSM-5 criteria for GD, and were assessed by experienced clinical psychologists and psychiatrists with more than 20 years working in the field. Having an intellectual disability or severe mental disorders (such as bipolar disorder, schizophrenia or other psychotic disorders) were exclusion criteria from the study.

Adult participants signed an agreement to participate in the study. Minors were requested signed consent from their parents/tutors prior to the study. Participants were reassured of their rights to confidentiality, anonymity, and withdrawal. Furthermore, details to contact the research team were handed. The research had obtained the ethics committee approval from the first author's university, as well as for the Ethics Committee of The Clinical Research Ethics Committee (CEIC) of Bellvitge University Hospital.

2.4 Statistical analyses

Statistical analysis was carried out with Stata16 for Windows [31]. Categorical variables were compared between patients who screened BSD positive versus negative scores through chi-square tests (χ^2). Quantitative measures were compared with T-TEST. The association between the buying-shopping severity (BSD dimensional and total scores) with the other clinical variables of the study was estimated through partial correlations (R) adjusted for the covariates participants' sex and age. Since a strong association has been defined between correlation statistical significance and sample sizes (high *R*-coefficients achieve non-significance estimated into low sample size, while small *R*-coefficients achieve significance into large sample size), the relevance of the partial correlations was based on the own coefficients effect size: low-poor effect size was considered for $|R|>0.10$, moderate-medium for $|R|>0.24$ and large-high for $|R|>0.37$ (these thresholds corresponds to Cohen's-d of 0.20, 0.50 and 0.80 respectively [32]).

Generalized Linear Models (GLM) using the Normal-distribution and the Identity Link Function tested the specific contribution of the variables sex, age, materialism (total score), emotion dysregulation (DERS-total) and coping (global indexes) on the BSD severity (BSD total score). The GLM in this study were adjusted in two blocks/steps: a) first block/step entered and fixed the variables sex, age, materialism, emotion dysregulation and coping strategies; and b) second block/step added and tested the interaction parameters defined for the sex and age with the other clinical measures. After valuing the interaction parameters of the second block/step, the final model retained only those significant interaction terms ($p\leq.05$), and main effects were interpreted for non-significant interaction parameters and single effects for significant interaction parameters.

In this work, the Holm's procedure was also used to control increases in the Type-I error due to multiple statistical comparisons (Holm's method is included into the Familywise error rate stepwise techniques and it has demonstrated more statistical power than the classical Bonferroni correction [33]). In addition, global measures were selected for the GLM due to the large set of variables, and all the analyses were stratified by the origin of the sample (community versus clinical) to permit testing differences in the relationship patterns due to the origin of the sample and to allow external generalization to the original populations (community and clinical settings).

5. Results

Characteristics of the sample and comparison between groups

The prevalence of participants who met criteria for BSD positive screening score was 4.8% in the community sample versus 9.7% in the clinical sample (χ^2=1.30, *df*=1, *p*=.255). Comparison between both samples for the mean scores registered in the BSD achieved no differences: a) for the factor loss of control and consequences means were equal to 3.1 (SD=3.8) in the community sample versus 4.4 (SD=5.5) in the clinical sample (T=1.68, *df*=279, *p*=.094); b) for the factor excessive buying means were 2.4 (SD=3.1) versus 3.5 (SD=2.7) in community and clinical groups (T=1.95, *df*=279, *p*=.052); and c) for the total score means were 6.5 (SD=5.9) versus 6.8 (SD=8.2) in community and clinical groups (T=0.20, *df*=279, *p*=.841).

The comparison between the groups who met BSD positive versus negative screening score, stratified by the origin of the sample (community versus clinical) is included in Table S1 (supplementary material). No differences between the groups were found for the sociodemographic variables (sex, education level and origin). However, some differences were found for the psychological and clinical variables of the study. Firstly, into the community sample, participants who met BSD positive achieved higher mean scores in all the scales of the materialism questionnaire [relevance: 11.2 vs 8.7 (*p*=.002); happiness: 13.3 vs 10.2 (*p*=.002); success: 15.9 vs 11.8 (*p*=.002); and total: 40.4 vs 30.6 (*p*=.001);], in the emotion dysregulation factors measuring impulse control difficulties [16.7 vs 11.5, (*p*=.001)], limited emotion regulation [19.4 vs 15.3, (*p*=.021)] and global dysregulation[94.7 vs 78.2, (*p*=.005)]; into this sample, the BSD positive group was also related to lower mean in the CSI first order scale measuring problem solving [9.8 vs 12.5, (*p*=.049)]. Regarding the comparisons into the clinical sample, BSD positive screening score was related to lower mean in the CSI first order dimensions measuring wishful thinking [6.3 vs 15.1, (*p*=.012)] and self-blame [6.3 vs 13.7, (*p*=.040)]. (Comparisons reported in Table S1 must be considered with caution due the low prevalence of participants who met positive screening score, particularly in the clinical sample).

Association between BSD severity with the psychological profile

Table 1 contains the partial correlations (adjusted by the participants' sex and age), estimating the relationships between the BSD dimensional scores with the measures of materialism, emotion dysregulation and coping strategies. Into the community sample,

positive associations were found between BSD severity with materialism and emotion dysregulation levels (in the case of the DERS scale scores, only associations were found with the BSD factors loss of control/consequences and total). No relevant correlations were found for the BSD scores with the coping strategies dimensional scores among the participants recruited in the community sample.

Into the clinical sample, BSD severity was higher for participants who reported higher levels in the materialism measures. Regarding emotion dysregulation, higher scores in the BSD factor loss of control/consequences were related to higher levels of non-acceptance of emotions and impulse control difficulties, while higher scores in excessive buying were related to lower scores in difficulties in directed behavior and limited emotion regulation. Considering the coping strategies analyzed in the study, as a whole as higher the BSD severity as lower the scores in the CSI factors.

--- Insert Table 1 ---

The results of the final GLM models testing the contribution of sex, age, materialism, emotion dysregulation and coping on the BSD severity are showed in Table 2. For the population-based sample, six significant interactions (between the participants' sex and age with the other measures) were retained, indicating that the concrete contribution of materialism, emotion dysregulation and coping on the BSD total score was different for women and men, as well as for the different groups of age. The results of the final GLM among this sample indicated that as a whole BSD is more severe for younger participants. Higher levels of emotion dysregulation and coping adequate global also were related to greater severity in the BSD, and the intensity of the relationship was also higher for men compared to women. Regarding materialism values, as higher the materialism scores as higher the BSD severity, but the intensity of the relationships is dependent on sex (stronger associations for women compared with men) and age (as high the age as high the contribution of materialism on the BSD severity). For the coping global disengagement, higher values in this dimension increased the BSD level for women, and the intensity of the relationship was also higher as high the women's age; for men, lower scores in the coping global disengagement were related with higher BSD, but the intensity of the relationship decreased with age (for older participants, the association was non-significant).

--- Insert Table 2 ---

The results of the final model obtained among the patients into the clinical sample showed that BSD was more severe for men, younger patients and those with higher scores in the materialism total scale. Regarding coping strategies, the contribution of the global

dimensions with BSD was different depending on the participants' age: lower scores in the coping global engagement only contributed to increase the BSD severity for young individuals, while lower scores in the coping global disengagement increased the level of BSD at any group of age (it was also observed that the magnitude of the relationship decreased with ages). The contribution of the emotion dysregulation on BSD depended of both, sex and age: for women, high emotion dysregulation increased the BSD severity only for young and middle ages, while for men emotion dysregulation increased the BSD severity for young ages and decreased the BSD severity for old ages.

6. Discussion

The aims of the present study were to explore, among a community sample and a clinical sample of treatment-seeking individuals with GD, the differences in BSD, coping skills, emotional regulation and materialism, as well as the relationship between the last three variables and BSD and their interaction with age and gender. The results showed that there were differences in the way the variables relate to BSD depending on the age and gender of the participants.

First of all, it is important to mention that there were no differences for the BSD levels reported in both samples, but there were differences for the rest of the variables in each group between those who present BSD and those who do not. In the community sample, our results support the theory of the materialism as a risk factor for the development of BSD [23,34,35] in young people, as well as the use of shopping as a way to regulate negative emotions [36,37] associated with a lack of impulse control. The lower values of problem solving skills, in those who meet BSD criteria, are in concordance with the report use of active coping strategies of problem solving as a protector factor for the development of BSD [38], in contrast with the passive-avoidance coping strategies [10].

The fact that the clinical sample exhibited no differences in emotion dysregulation between those with BSD and those who did not have it, we argue that both conditions, BSD and GD, as behavioural addictions, share some vulnerability factors. In this vein, emotion regulation difficulties have been reported in both [37,39–42]. Such difficulties, which can be seen in addictive behaviours, are used as a maladaptive method to regulate or avoid negative affective states [36,43,44].

Similarly, materialism values have been point out as another common characteristic between both disorders, as several studies previously demonstrated [9,45]. However, there were differences in coping skills, that is the lower self-blame and wishful thinking in those

who meet BSD criteria. That is not concordant with previous literature [38], which suggests that self-blame and low self-esteem lead to overcompensating both conditions by possessing material goods.

Having established that there are differences in the variables of the study between participants with and without BSD, this study went a step forward into analysing in which way materialism, coping skills, and emotion dysregulation related to BSD (second aim of the research).

In both samples, the severity of BSD was related to higher levels of materialism values, but only in the clinical sample higher severity was related to lower scores in coping strategies. In the literature, BSD has been suggested as an avoidance coping strategy *per se* [46,47], opening the debate about whether it should be regarded as a psychopathological condition or merely a coping strategy [39]. Our results further highlight the important role that coping strategies play in the condition, and how beneficial could be for patients to train their coping skills. Also in both samples, emotion dysregulation was related to BSD severity factors, but in a different. In the case of the community cohort, difficulties in emotional regulation were positively associated with the loss control and consequences factor of the BSD while in the clinical sample, it was related to both factors of the BSD.

Finally, regarding the interaction of the study variables on the BSD severity was different for women and men, and differed also in different ages, the results showed that in the community sample, BSD was more severe in younger participants, as have already been report in other studies [48]. However, the interaction of age with other variables greatly depended on gender, with higher levels of materialism and non-adequate strategies of coping associated with increased BSD in women. In contrast, in men their non-adequate coping skills and buying behaviour decreased with age, and higher levels in emotion dysregulation were related to more severity in their buying patterns. This has significant implications in the sense that, although the scientific literature typically links greater excessive shopping behaviour with younger ages, the data in the present study indicates that in women buying behaviour can increase over time, being more severe later in life. Therefore, maintaining prevention strategies addressed to all age groups seems to be adequate.

In the clinical sample, we can also observe that age and gender influenced the observed variables. BSD was more severe in men, younger, and with higher materialism values, and lower coping adequate strategies increased the severity of BSD in younger individuals as well. It is important to note that even though BSD has been reported to be more usual in women, other studies have shown that the co-occurrence of GD and BSD is higher

among men [3] and that being male increases the risk of the comorbid presence of both conditions [7]. The fact that BSD was more severe among younger participants must be taken into account for prevention purposes, considering that an earlier onset is associated with a worse prognosis [49,50]. Regarding emotion dysregulation, it increased BSD among young and middle aged women, while in men BSD only increased among younger participants.

7. Limitations

The present study comes with a series of limitations. First, the low number of participants who met BSD criteria in the clinical sample makes the results less more difficult to generalize; for future studies, it would be important to analyse a larger sample of subjects who fulfil both conditions (i.e., GD and BSD). Second, the study only included self-report measures, which are sensitive to a number of biases including memory bias and social desirability bias.

8. Conclusions

The most relevant differences in this study were not found between the community and clinical samples but within each sample. A major finding in this study had to do with the role of age and sex in BSD. On the one hand, the results aligned with the existing literature in showing that younger ages are more associated with excessive shopping behavior. However, on the other hand, age played a different role for women and men. While men exhibited poorer scores in younger ages and improved over time, older women scored worse in most of the studied variables as compared to younger women. This has important ramifications for prevention, as preventive strategies should be more cognizant of the gender differences in order to adjust their content and approach.

Acknowledgements:

We thank CERCA Programme / Generalitat de Catalunya for institutional support. This manuscript and research was supported by grants from the Ministerio de Econom_ıa y Competitividad (PSI2015-68701-R and RTI2018-101837-B-100), and funded by Ministerio de Sanidad, Servicios Sociales e Igualdad, Plan Nacional sobre Drogas (2017/I067), Instituto de Salud Carlos III (ISCIII) (FIS PI14/00290 and P1117/01167), and co-funded by FEDER funds /European Regional Development Fund (ERDF), a way to build Europe. CIBERObn and CIBERSAM are both initiatives of ISCIII. We also thank the Spanish Organisation of Blind People (ONCE) for being awarded their III International Research Grant. TMM, MLM and CVA are supported each one by a predoctoral Grant of the Ministerio de Educaci_on, Cultura y Deporte (FPU16/02087; FPU15/02911; FPU16/01453).

No potential conflict of interest was reported by the author(s).

References

[1] Diez-Marcet D, Valdeperez-Toledo A, Aragay-Vicente N, Soms-Casals M. El trastorno de Compra Compulsiva. Cuad Med Psicosomática 2016;117:11–6.

[2] Rodriguez Garza M, Saucedo Soto J, Hernández Bonilla A, Gutierrez Calzoncit O. Análisis del comportamiento de comprar para identificar compradores compulsivos en Saltillo, Coahuila México. Rev Int Adm Finanz 2016;9:27–44.

[3] Granero R, Fernández-Aranda F, Steward T, Mestre-Bach G, Baño M, Del Pino-Gutiérrez A, et al. Compulsive Buying Behavior: Characteristics of Comorbidity with Gambling Disorder. Front Psychol 2016;7:625. doi:10.3389/fpsyg.2016.00625.

[4] Achtziger A, Hubert M, Kenning P, Raab G, Reisch L. Debt out of control: The links between self-control, compulsive buying, and real debts. J Econ Psychol 2015;49:141–9. doi:10.1016/j.joep.2015.04.003.

[5] Claes L, Müller A, Luyckx K. Compulsive buying and hoarding as identity substitutes: The role of materialistic value endorsement and depression. Compr Psychiatry 2016;68:65–71. doi:10.1016/j.comppsych.2016.04.005.

[6] Granero R, Fernández-Aranda F, Baño M, Steward T, Mestre-Bach G, Del Pino-Gutiérrez A, et al. Compulsive buying disorder clustering based on sex, age, onset and personality traits. Compr Psychiatry 2016;68:1–10. doi:10.1016/j.comppsych.2016.03.003.

[7] Guerrero-Vaca D, Granero R, Fernández-Aranda F, González-Doña J, Müller A, Brand M, et al. Underlying mechanism of the comorbid presence of buying disorder with gambling disorder: A pathways analysis. J Gambl Stud 2019;35:261–73. doi:10.1007/s10899-018-9786-7.

[8] Jiménez-Murcia S, Granero R, Moragas L, Steiger H, Israel M, Aymamí N, et al. Differences and similarities between bulimia nervosa, compulsive buying and gambling disorder. Eur Eat Disord Rev 2015;23:126–32. doi:10.1002/erv.2340.

[9] Black DW, Shaw M, Blum N. Pathological gambling and compulsive buying: do they fall within an obsessive-compulsive spectrum? Dialogues Clin Neurosci 2010;12:175–85.

[10] Singh DA, Kedare JS, Kumar A. It takes two to tango! A study to understand the relationship between compulsive buying and coping strategies. Int J Sci Res 2018;6:7–10.

[11] Compas BE, Connor-Smith JK, Saltzman H, Thomsen AH, Wadsworth ME. Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. Psychol Bull 2001;127:87–127.

[12] Gross JJ, Thompson RA. Emotion regulation: Conceptual foundations. In: Gross JJ, editor. Handkb. Emot. Regul., Nueva York: Guilford Press; 2007, p. 3–24.

[13] Gross JJ. The Emerging Field of Emotion Regulation: An Integrative Review. vol. 2. 1998.

[14] Darrat AA, Darrat MA, Amyx D. How impulse buying influences compulsive buying: The central role of consumer anxiety and escapism. J Retail Consum Serv 2016;31:103–8. doi:10.1016/j.jretconser.2016.03.009.

[15] Gómez-Romero MJ, Limonero JT, Toro Trallero J, Montes-Hidalgo J, Tomás-Sábado J. Relationship between emotional intelligence and negative affect on suicide risk in young university students. Ansiedad Y Estres 2018;24:18–23. doi:10.1016/j.anyes.2017.10.007.

[16] Estévez Gutiérrez A, Herrero Fernández D, Sarabia Gonzalvo I, Jáuregui Bilbao P. El papel mediador de la regulación emocional entre el juego patológico, uso abusivo de Internet y videojuegos y la sintomatología disfuncional en jóvenes y adolescentes. Adicciones 2014;26:282–90. doi:10.20882/adicciones.26.

[17] Jurado D, Sejnaui P, Uribe-Rodríguez AF. Impulsividad en la compra en estudiantes universitarios. Rev Psicol Univ Antioquia 2011;3:25–38.

[18] Wardell JD, Quilty LC, Hendershot CS, Bagby RM. Motivational Pathways from Reward Sensitivity and Punishment Sensitivity to Gambling Frequency and Gambling-Related Problems. Psychol Addict Behav 2015;29:1022–30. doi:10.1037/adb0000066.

[19] Moulding R, Duong A, Nedeljkovic M, Kyrios M. Do You Think That Money Can Buy Happiness? A Review of the Role of Mood, Materialism, Self, and Cognitions in Compulsive Buying. Curr Addict Reports 2017;4:254–61. doi:10.1007/s40429-017-0154-y.

[20] Richins M, Dawson S. A consumer values orientation for materialism and its measurement: scale development and validation. J Consum Res 1992;19:303–16. doi:10.1086/209304.

[21] Otero-López JM, Villardefranco E. Matrialismo y adicción a la compra: Examinando el papel mediador de la autoestima. Boletín Psicol 2011;103:45–59.

[22] Coria MD, Aravena JS, Cifuentes TG, Berkhoff GR, Martínez JU, Inostroza D V. Actitudes hacia el consumo y materialismo en estudiantes universitarios de pedagogía en Chile. Fronteras 2015;1:45–62.

[23] Pérez-Latre F, Bringué X. Comunicación efectiva en circunstancias difíciles: el público entre 14 y 19 años. Rev Estud Juv 2005;68:53–60.

[24] Müller A, Trotzke P, Mitchell JE, De Zwaan M, Brand M. The Pathological Buying Screener: Development and psychometric properties of a new screening instrument for the assessment of pathological buying symptoms. PLoS One 2015;10. doi:10.1371/journal.pone.0141094.

[25] Fernández-Aranda F, Granero R, Mestre-Bach G, Steward T, Müller A, Brand M, et al. Spanish validation of the pathological buying screener in patients with eating disorder and gambling disorder. J Behav Addict 2019;8:123–34. doi:10.1556/2006.8.2019.08.

[26] Lado Couste N, ML VO. Los valores materiales en el comportamiento del consumidor: un estudio exploratorio de los jóvenes. Rev Española Investig Mark ESIC 1998;3:87–101.

[27] Tobin DL, Holroyd KA, Reynolds R V., Wigal JK. The hierarchical factor structure of the coping strategies inventory. Cognit Ther Res 1989;13:343–61. doi:10.1007/BF01173478.

[28] Cano García FJ, Rodríguez Franco L, García Martínez J. Adaptación española del Inventario de Estrategias de Afrontamiento / Spanish version of the Coping Strategies Inventory. Actas Españolas Psiquiatr 2007;35:29–39.

[29] Gratz KL, Roemer L. Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. J. Psychopathol. Behav. Assess., vol. 26, Kluwer Academic/Plenum Publishers; 2004, p. 41–54. doi:10.1023/B:JOBA.0000007455.08539.94.

[30] Wolz I, Agüera Z, Granero R, Jiménez-Murcia S, Gratz KL, Menchón JM, et al. Emotion regulation in disordered eating: Psychometric properties of the Difficulties in Emotion Regulation Scale among Spanish adults and its interrelations with personality and clinical severity. Front Psychol 2015;6:907. doi:10.3389/fpsyg.2015.00907.

[31] Stata-Corp. Statistical Software: Release 15. College Station, TX StataCorp LLC 2017.

[32] Rosnow R, Rosenthal R. Computing contrasts, effect sizes, and counternulls on other people's published data: General procedures for research consumers. Psychol Methods 1996;1:331–40.

[33] Holm S. A simple sequentially rejective multiple test procedure. Scand J Stat 1979;6:65–70.

[34] Dittmar H. Compulsive buying - A growing concern? An examination of gender, age, and endorsement of materialistic values as predictors. Br J Psychol 2005;96:467–91. doi:10.1348/000712605X53533.

[35] Villardefrancos E, Otero-López JM. Compulsive buying in university students: its prevalence and relationships with materialism, psychological distress symptoms, and subjective well-being. Comprenhensive Psychiatry 2016;65:128–35.

[36] 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.

[37] Williams AD, Grisham JR. Impulsivity, emotion regulation, and mindful attentional focus in compulsive buying. Cognit Ther Res 2012;36:451–7. doi:10.1007/s10608-011-9384-9.

[38] Otero-López JM, Villardefrancos E. Prevalence, sociodemographic factors, psychological distress, and coping strategies related to compulsive buying: a cross sectional study in Galicia, Spain. BMC Psychiatry 2014;14:101. doi:10.1186/1471-244X-14-101.

[39] Da Silva TL. Compulsive Buying: Psychopathological Condition, Coping Strategy or Sociocultural Phenomenon? A Review. J Addict Behav Ther Rehabil 2015;4:2. doi:10.4172/2324-9005.1000137.

[40] Kellett S, Bolton J V. Compulsive buying: A cognitive-Behavioural model. Clin Psychol Psychother 2009;16:83–99. doi:10.1002/cpp.585.

[41] Mallorquí-Bagué N, Mena-Moreno T, Granero R, Vintró-Alcaraz C, Sánchez-González J, Fernández-Aranda F, et al. Suicidal ideation and history of suicide attempts in treatment-seeking patients with gambling disorder: The role of emotion dysregulation and high trait impulsivity. J Behav Addict 2018;7:1112–21. doi:10.1556/2006.7.2018.132.

[42] Williams AD, Grisham JR, Erskine A, Cassedy E. Deficits in emotion regulation associated with pathological gambling. Br J Clin Psychol 2012;51:223–38. doi:10.1111/j.2044-8260.2011.02022.x.

[43] Claes L, Jimenez-Murcia S, Agüera Z, Sánchez I, Santamaría J, Granero R, et al. Eating disorders and pathological gambling in males: can they be differentiated by means of weight history and temperament and character traits? Eat Disord J Treat Prev 2012;20:395–404. doi:10.1080/10640266.2012.715517.

[44] Fernandez-Aranda F, Pinheiro AP, Thornton LM, Berrettini WH, Crow S, Fichter MM, et al. Impulse control disorders in women with eating disorders. Psychiatry Res 2008;157:147–57.

[45] Müller A, Claes L, Georgiadou E, Möllenkamp M, Voth EM, Faber RJ, et al. Is compulsive buying related to materialism, depression or temperament? Findings from a sample of treatment-seeking patients with CB. Psychiatry Res 2014;216:103–7. doi:10.1016/j.psychres.2014.01.012.

[46] Faber R. Diagnosis and Epidemiology of Compulsive Buying. In: Mueller A MJ, editor. Compuls. Buying. Clin. Found. Treat., New York: Taylor and Francis Group; 2011, p. 3–17.

[47] Roberts JA, Roberts C. Stress, gender and compulsive buying among early adolescents. Young Consum 2012;13:113–23. doi:10.1108/17473611211233440.

[48] Maraz A, Griffiths MD, Demetrovics Z. The prevalence of compulsive buying: A meta-analysis. Addiction 2015;111:408–19. doi:10.1111/add.13223.

[49] Jiménez-Murcia S, Alvarez-Moya EM, Stinchfield R, Fernández-Aranda F, Granero R, Aymamí N, et al. Age of onset in pathological gambling: clinical, therapeutic and personality correlates. J Gambl Stud 2010;26:235–48. doi:10.1007/s10899-009-9175-3.

[50] Jiménez-Murcia S, Granero R, Tárrega S, Angulo A, Fernández-Aranda F, Arcelus J, et al. Mediational Role of Age of Onset in Gambling Disorder, a Path Modeling Analysis. J Gambl Stud 2016;32:327–40. doi:10.1007/s10899-015-9537-y.

Table 1 Association of buying-shopping disorder severity with materialism, emotional regulation, and coping strategies: partial correlation adjusted by sex and age

	Community; *(n=250)*			Clinical; *(n=31)*		
Pathological Buying Scale →	F1	F2	Total	F1	F2	Total
Materialism: relevance	.149	.189	.181	**.551†**	**.509†**	**.559†**
Materialism: happiness	**.271†**	.230	**.281†**	**.480†**	**.326†**	**.442†**
Materialism: success	**.297†**	**.240†**	**.300†**	**.392†**	**.399†**	**.412†**
Materialism: total score	**.341†**	**.299†**	**.356†**	**.550†**	**.480†**	**.547†**
DERS: Non-acceptance emotion	.229	.170	.227	**.258†**	-.087	.138
DERS: Difficulties directed behaviour	**.247†**	.188	**.248†**	-.035	**-.265†**	-.124
DERS: Impulse control difficult.	**.363†**	.231	**.340†**	**.270†**	-.019	.172
DERS: Lack of emotional awareness	.076	-.061	.020	.017	.176	.078
DERS: Limited emotion regulation	**.263†**	.151	**.240†**	-.060	**-.304†**	-.155
DERS: Lack of emotional clarity	.122	.088	.122	-.042	-.113	-.071
DERS: Total score	**.324†**	.186	**.296†**	.111	-.169	.009
CSI; F1: problem solving	-.106	-.017	-.076	-.115	**-.266†**	-.177
CSI; F1: cognitive restructure	-.008	-.017	-.012	-.180	**-.490†**	**-.306†**
CSI; F1: emotional expression	.099	.112	.118	-.032	**-.254†**	-.118
CSI; F1: social support	.055	.081	.074	**-.246†**	**-.312†**	**-.282†**
CSI; F1: problems avoidance	.100	.016	.072	.186	-.115	.080
CSI; F1: wishful thinking	.142	.179	.175	**-.424†**	**-.607†**	**-.512†**
CSI; F1: self-blame	.149	.056	.124	**-.360†**	**-.575†**	**-.457†**
CSI; F1: social withdrawal	.139	.006	.093	-.129	**-.366†**	-.224
CSI; F2: problem engagement	-.058	-.016	-.044	-.159	**-.405†**	**-.259†**
CSI; F2: emotion engagement	.088	.110	.109	-.147	**-.299†**	-.211
CSI; F2: problem disengagement	.146	.125	.152	-.175	**-.474†**	**-.297†**
CSI; F2: emotion disengagement	.166	.036	.125	**-.284†**	**-.543†**	**-.395†**
CSI; Global: engagement	.018	.053	.038	-.164	**-.372†**	**-.250†**
CSI; Global: disengagement	.178	.092	.158	**-.243†**	**-.533†**	**-.364†**

Note. F1: loss of control – consequences. F2: excessive buying.

†Bold: effect size into the medium-mean (|*R*|>0.24) to high-large (|*R*|>0.37) range.

Table 2 GLM with the final models including only significant interaction parameters

Community sample, n=250		*B*	*SE*	*95%CI(B)*		*p*
Sex (0=female; 1=male)		0.477	0.866	-1.220	2.174	.582
Age (years-old)		-0.654	0.061	-0.773	-0.534	**<.001***
[1]Materialism	*Women-young age (14 yrs)*	0.207	0.013	0.180	0.233	**<.001***
	Women-middle age(17 yrs)	0.278	0.013	0.253	0.303	**<.001***
	Women-old age (27 yrs)	0.516	0.024	0.470	0.563	**<.001***
	Men-young age (14 yrs)	0.071	0.016	0.040	0.101	**<.001***
	Men-middle age(17 yrs)	0.142	0.013	0.118	0.167	**<.001***
	Men-old age (27 yrs)	0.380	0.018	0.345	0.416	**<.001***
[2]Emotion dysregulation	*Females*	0.042	0.006	0.031	0.053	**<.001***
	Males	0.080	0.005	0.069	0.090	**<.001***
[2]Coping: engagement	*Females*	0.018	0.007	0.005	0.032	**.008**
	Males	0.047	0.007	0.034	0.060	**<.001***
[1]Coping: disengagement	*Women-young age (14 yrs)*	0.052	0.009	0.034	0.069	**<.001***
	Women-middle age(17 yrs)	0.066	0.009	0.050	0.083	**<.001***
	Women -old age (27 yrs)	0.116	0.013	0.090	0.143	**<.001***
	Men-young age (14 yrs)	-0.067	0.010	-0.087	-0.048	**<.001***
	Men-middle age(17 yrs)	-0.052	0.008	-0.069	-0.036	**<.001***
	Men-old age (27 yrs)	-0.003	0.010	-0.023	0.018	.806
Interaction: Sex-by-Materialism		-0.136	0.018	-0.171	-0.101	**<.001***
Interaction: Sex-by-Emotion dysregulation		0.038	0.008	0.022	0.053	**<.001***
Interaction: Sex-by-Coping engagement		0.028	0.010	0.009	0.047	**.003***
Interaction: Sex-by-Coping disengagement		-0.119	0.012	-0.142	-0.095	**<.001***
Interaction: Age-by-Materialism		0.024	0.002	0.020	0.028	**<.001***
Interaction: Age-by-Coping disengagement		0.005	0.001	0.003	0.007	**<.001***
Clinical sample (n=31)		*B*	*SE*	*95%CI(B)*		*p*
Sex (0=female; 1=male)		9.995	3.256	3.614	16.376	**.002***
Age (years-old)		-1.412	0.556	-2.502	-0.321	**.011***
Materialism: Total score		0.604	0.025	0.555	0.652	**<.001***
[1]Emotion dysregulation	*Women-young age (17 yrs)*	0.196	0.045	0.108	0.285	**<.001***
	Women-middle age(21 yrs)	0.117	0.039	0.041	0.194	**.003***
	Women-old age (24 yrs)	0.058	0.046	-0.031	0.148	.202
	Men-young age (17 yrs)	0.062	0.027	0.010	0.115	**.019***
	Men-middle age(21 yrs)	-0.016	0.013	-0.041	0.008	.194
	Men-old age (24 yrs)	-0.076	0.026	-0.127	-0.024	**.004***
[3]Coping: engagement	*Young age (17 yrs)*	-0.141	0.020	-0.180	-0.101	**<.001***
	Middle age(21 yrs)	0.015	0.018	-0.020	0.050	.395
	Old age (24 yrs)	0.132	0.033	0.068	0.197	**<.001***
[3]Coping: disengagement	*Young age (17 yrs)*	-0.321	0.026	-0.372	-0.270	**<.001***
	Middle age(21 yrs)	-0.191	0.020	-0.230	-0.153	**<.001***
	Old age (24 yrs)	-0.094	0.037	-0.166	-0.022	**.010***
Interaction: Sex-by-Emotion dysregulation		-0.134	0.037	-0.207	-0.061	**<.001***
Interaction: Age-by-Emotion dysregulation		-0.020	0.007	-0.033	-0.007	**.003***
Interaction: Age-by-Coping engagement		0.039	0.006	0.027	0.051	**<.001***
Interaction: Age-by-Coping disengagement		0.032	0.008	0.018	0.047	**<.001***

Note. *Bold: significant parameter (.05 level).

[1]Single effects for women and men, stratified by the percentiles of age P_5, P_{50} and P_{95} in the group.

[2]Single effects for women and men. [3]Single effects for the percentiles of age P_5, P_{50} and P_{95} in the group.

Table S1 (supplementary material) Comparison between groups for the variables of the study

			Community sample					Clinical sample				
			BSD=negative		BSD=positive			BSD=negative		BSD=positive		
			n=238		*n=12*			*n=28*		*n=3*		
Sociodemographics			*n*	*%*	*n*	*%*	*p*	*n*	*%*	*n*	*%*	*p*
Sex	*Female*		117	49.2%	7	58.3%	.535	3	10.7%	0	0%	.551
	Male		121	50.8%	5	41.7%		25	89.3%	3	100%	
Education level	*Primary school*		0	0%	0	0%	.367	5	17.9%	1	33.3%	.396
	Secondary school		111	46.6%	4	33.3%		11	39.3%	0	0%	
	High or Voc		127	53.4%	8	66.7%	.226	12	42.9%	2	66.7%	
Origin	*Spain*		212	89.1%	12	100%		25	89.3%	2	66.7%	.267
	Elsewhere		26	10.9%	0	0%		3	10.7%	1	33.3%	
Clinical measures		α	Mean	SD	Mean	SD	*p*	Mean	SD	Mean	SD	*p*
Age (years-old)			18.21	4.94	18.08	3.60	.928	20.89	2.48	20.00	1.00	.547
Materialism: Factor relevance		.757	8.70	2.73	11.17	2.55	**.002***	8.68	2.72	11.33	2.08	.114
Materialism: Factor happiness		.701	10.18	3.39	13.33	2.57	**.002***	10.79	3.32	12.67	0.58	.342
Materialism: Factor success		.815	11.77	4.44	15.92	2.68	**.002***	13.93	3.90	17.00	1.73	.192
Materialism: Total score		.801	30.63	7.62	40.42	4.70	**.001***	33.39	8.36	41.00	4.00	.135
DERS: Non-acceptance emotion		.870	10.88	4.74	13.25	6.77	.099	15.50	5.98	18.33	4.73	.436
DERS: Difficulties directed beh.		.793	12.53	4.44	14.00	5.33	.267	14.75	4.21	13.33	1.53	.572
DERS: Impulse control difficulties		.811	11.50	4.32	16.67	6.46	**.001***	13.93	4.97	15.33	2.08	.635
DERS: Lack emotional awareness		.824	17.30	5.50	19.00	6.61	.303	18.71	5.13	19.67	5.51	.763
DERS: Limited emotion regulation		.854	15.30	5.90	19.42	7.50	**.021***	19.39	7.31	18.00	1.00	.748
DERS: Lack of emotional clarity		.806	10.66	4.27	12.33	3.98	.185	13.21	4.58	12.33	4.04	.752
DERS: Total score		.911	78.17	19.62	94.67	15.69	**.005***	95.50	20.76	97.00	7.00	.903
CSI; F1: problem solving		.831	12.53	4.70	9.83	3.04	**.049***	10.50	5.08	8.00	7.21	.440
CSI; F1: cognitive restructure		.788	9.98	5.02	9.25	4.39	.622	10.43	3.97	7.00	6.08	.184
CSI; F1: emotional expression		.818	9.17	4.93	9.67	5.37	.736	10.04	5.17	7.67	7.09	.470
CSI; F1: social support		.821	11.89	5.32	13.58	4.34	.281	11.07	5.11	6.33	7.09	.150
CSI; F1: problems avoidance		.751	7.65	4.56	9.33	3.82	.211	7.96	4.78	9.00	7.81	.738
CSI; F1: wishful thinking		.844	12.04	5.56	13.25	4.20	.459	15.11	5.28	6.33	6.51	**.012***
CSI; F1: self-blame		.841	7.10	4.83	8.83	4.34	.223	13.68	5.58	6.33	6.03	**.040***
CSI; F1: social withdrawal		.752	6.55	4.57	7.92	4.23	.311	9.18	5.33	6.67	6.11	.449
CSI; F2: problem engagement		.870	22.53	8.78	19.08	6.13	.181	20.93	8.01	15.00	13.23	.259
CSI; F2: emotion engagement		.865	21.07	9.03	23.25	7.75	.413	21.11	9.67	14.00	14.00	.253
CSI; F2: problem disengagement		.815	19.67	8.32	22.58	6.16	.233	23.07	7.81	15.33	13.87	.139
CSI; F2: emotion disengagement		.851	13.65	8.13	16.75	7.57	.197	22.86	9.24	13.00	12.12	.097
CSI; Global: engagement		.908	43.61	16.20	42.33	12.26	.788	42.04	16.19	29.00	26.85	.221
CSI; Global: disengagement		.878	33.27	13.99	39.33	11.29	.141	45.93	16.18	28.33	25.97	.100

Note. SD: standard deviation. BSD: buying-shopping disorder.

High or Voc: Higher Education or vocational/technical training.

α: Cronbach's alpha in the sample. *Bold: statistical difference (.05 level).