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ONLINE AND OFFLINE SHOPPING ADDICTION AND ITS RELATIONSHIP WITH STATE-TRAIT ANXIETY AND IMPULSIVITY

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Abstract

Compulsive buying is a phenomenon that involves dysfunctional shopping behaviors together with a continuous concern about buying and problems derived from said behaviour that impact different aspects of daily life. This study aims to analyse some of the psychological factors related to compulsive buying both online and offline, such as anxiety and impulsivity. 202 Volunteers from both sexes between the ages 18 and 69 participated in the study**.** A questionnaire was designed based on the Barrat Impulsiveness Scale (BIS-11, 1995), the Bergen Shopping Adicction Scale (BSAS, 2015) and the State-Trait Anxiety Questionnaire (STAI, 1983). It was verified that the most impulsive and anxious individuals tend to perform more behaviors related to compulsive buying. No differences in compulsive buying based on age were found. It is interesting to delve into the implications derived from dysfunctional purchasing behaviors and the psychosocial implications of such practices.
KEY WORDS: *compulsive buying, anxiety, impulsivity, online buying, offline buying*.

Resumen

La compra compulsiva es un fenómeno que implica conductas de compra disfuncionales junto a una continua preocupación por comprar y problemas derivados del propio comportamiento en distintos ámbitos de la vida cotidiana. El objetivo de este estudio es analizar algunos de los factores psicológicos relacionados con la compra compulsiva tanto online como offline, tales como la ansiedad y la impulsividad. Participaron 202 voluntarios de ambos sexos entre 18 y 69 años. Se diseñó un cuestionario utilizando la "Escala de impulsividad de Barrat" (BIS-11, 1995), la "Escala de adicción a las compras de Bergen" (BSAS, 2015) y el "Cuestionario de ansiedad estado-rasgo" (STAI, 1983). Se comprobó que los individuos más impulsivos y ansiosos tienden a realizar más comportamientos relacionados con la compra compulsiva. No se constataron diferencias en la compra compulsiva en función de la edad. Resulta de interés profundizar en las implicaciones derivadas de las conductas de compra disfuncionales y en las implicaciones psicosociales de tales prácticas.
PALABRAS CLAVE: *compra compulsiva, ansiedad, impulsividad, compra online, compra offline.*

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Introduction

Shopping is part of our daily lives, although the dysfunctional behaviours associated with it can generate a negative impact psychologically, socially and financially among other aspects, are considered *compulsive buying* or *pathological buying*. Said concepts comprise an inadequate and maladaptive behavioural pattern, usually performed alone, intrusive thoughts and frequent episodes of excessive buying perceived as out of the individual's control from which the person gets a short-term gratification (Ahn te al., 2020; Challet-Bouju et al., 2020; Jung, 2017; Racine et al., 2014).

Despite the numerous studies about the negative impact and the psychological mechanisms underlying compulsive buying, this disorder is not included in the latest edition of the "Diagnostic and Statistical Manual of Mental Disorders" (DSM-5; *American Psychiatric Association* [APA], 2013), even though it was in DSM-III-R as an example of a non-specific impulse control disorder (Black, 2007). The latest edition of the International Classification for Diseases (ICD-11) by the World Health Organisation did include it in "Other Specific Impulse Control Disorders" ("compulsive buying-shopping disorder, category 6C7Y) [WHO], 2019). More controversial is its consideration as a behavioural addiction, under the name of Shopping Addiction, conceptualised by Müller et al. (2019). Individuals with shopping addiction symptoms are now classified, at least in the DSM-5, in the "other disruptive behaviour and impulse disorders" category due to an insufficient number of diagnostic criteria for it to be considered a formal diagnosis (Lee et al., 2019). However, according to Müller et al. (2019), both etiologic and phenomenological similarities with other behavioural addictions are ignored: the act of buying implies a positive reinforcement at first, the purpose of it is to alleviate emotions and situations perceived as negative and/or stressful. This shift in the reinforcing value of the buying behaviour is consistent with the current addiction models (Müller et al., 2019; Nicolai et al., 2016; Pickering et al., 2023). Other studies found compulsive buyers are likely to experiment symptoms of withdrawal (Ausburguer et al., 2020), which fits more a behavioural addiction rather than a residual subcategory of impulse control disorders.

In order to define the concept and characteristics of the disorder, Müller et al. (2021a) established some diagnostic criteria: intrusive thoughts or worries about shopping, loss of control over shopping habits, buying more than what can be afforded and/or unnecessary items, use of shopping as a regulation strategy of internal states, interference with daily life causing stress, social and/or financial problems and persistence or increase of the excessive shopping despite the negative consequences (Müller et al., 2021a). Given the lack of consensus about the diagnostic entity of shopping addiction, terms such as compulsive buying, pathological buying or oniomania, among other accepted terms, are used in specific literature (see Ahn et al., 2020; DeSarbo & Edwards, 1996; González & Lemos, 2020; Harnish & Roster, 2019).

The prevalence rates vary according to the country in which investigations are carried out. A meta-analysis by Maraz et al. (2016), based on 49 studies from different countries, estimates the prevalence of pathological buying to be approximately 5% of adult population, being greater in women and young adults, albeit the use of different methodologies and the diversity previously mentioned make this figure relative. Studies with an unified methodology should be conducted in order to provide more insightful data (Maraz et al., 2016; Müller et al., 2011). Díez, Valdepérez, Aragay and Soms (2015) state compulsive buying affects about 1% to 11.3% of the general population whereas it can differ depending on the sociocultural context. The results are diverse: in Spain it is estimated 7.1% (Otero-López & Villardefrancos, 2014), between 1.8% and 8.1% in the United States (Black, 2010) or 16% in Colombian university students (González & Lemos, 2020). As for age, according to Black (2010), the age of manifestation would be between 18 and 30 years of age but other investigations suggest the age-compulsive buying varies or is really low (Kyrios et al., 2020; Ye et al., 2021).

Regarding its etiologic foundation, several biologic, psychologic and cultural factors have been found. On the biological side, the deficit in neurotransmitters such as the dopaminergic system could be one of the explanations of its manifestation (Black, 2010). On the other side of the *continuum,* cultural factors like the materialistic culture were found (Baumeister et al., 1994). Peer pressure towards purchasing made by the social circle and learning by observing relatives or an authoritarian style of parenting can also contribute to the development and perseverance of the compulsive buying behaviours (Aboujaoude, 2014). Interestingly enough, purchasing power is not influential in compulsive shopping, only being linked to the of products the individual can afford or establishments they can visit (Black, 2007, 2010). Both the intensity of the motives that drive compulsive purchases and their intensity determine, according to DeSarbo and Edwards (1996) two types of compulsive buyers. While internal compulsive buyers seem influenced by the impulsivity and the anxiety, as main psychological factors of their emotional distress that they try to avoid by shopping styles that delusionally provide them of control and power, those classified as external compulsive buyers present a maladaptive behaviour motivated by the materialism, an avoidant confrontation style and an external orientation of responsibility.

Given the interest in studying the relationship between the individual differences and the manifestations of compulsive buying, it must be highlighted that personality is a factor related to the tendency of problematic shopping behaviour. It should be reminded that one of the most accepted personality models is the five-factor model of personality by McCrae and Costa (2008) which has been associated with behavioural addictions (see Echeburúa & De Corral, 2010; Puerta-Cortés & Carbonell, 2014; Steibel et al., 2016). Specifically, it has been ascertained the connection between some of the dimensions of the five-factor model and compulsive shopping. In particular, among the risk factors, impulsivity and anxiety, which will be subjected to analysis in this study, are two

traits included in this taxonomy under the neuroticism factor and for which empirical evidence of their relation exists. Some facets like anxiety, hostility, impulsivity and vulnerability, among others, are part of this dimension (Laak, 1996). Neuroticism, as a tendency to experience negative emotions like stress and anger, is associated to a low tolerance to stress and frustration, as well as with emotional reactivity which decision making and confrontation of negative vital experiences. Thus, compulsive buying is related to an imbalance in individual responsibility and stress confrontation styles (Rodríguez, 2004).

Among the psychological factors related to compulsive shopping, the most studied has been impulsivity, defined by Whiteside (2001) as a multidimensional construct of five dimensions: lack of premeditation, inability to persist in tasks considered difficult or boring by the individual, act hastily as reaction to both negative and positive emotions (negative and positive urgency respectively) and sensation seeking. According to Jung (2017), it could be described as a tendency to shop in a very unpredictable and irreflexive way accompanied by a loss of control over the need to buy.

Over the last decade, the correlation between impulsivity and compulsive buying as well as impulsivity's prediction over compulsive buying has been demonstrated (Aydin et al., 2021; De Paula et al., 2015; González & Lemos, 2020; Lindheimer et al., 2020; Nicolai et al., 2016; Tiegoe et al., 2019). Moreover, correlations between pathological buying and deficits on self-control and executive functions (Billeux et al., 2008; Racine et al., 2014). Zander et al. (2016) and Challet-Bouju et al. (2020) verified that individuals with compulsive shopping symptoms presented higher impulsivity levels than casual buyers. Comorbidity between impulsivity and compulsive shopping in the longitudinal study of Zhang et al. (2017).

Despite this correlation being well documented from the psychosocial perspective, it has not been possible to establish it from a neurological point of view (Vogel et al., 2019; Voth et al., 2014). This discrepancy suggests that the deficit in the inhibitory control of responses is situational and not derived from a neurological issue. In this case, impulsivity associated to the compulsive buying could be a consequence of the continuous acquirement of products. Following this line, an associative learning would take place, leading to stimuli that predict buying behaviours in order to generate particular physiological responses that can only be alleviated through shopping (Pickering et al., 2023). Impulsivity would be considered a method of regulation rather than a neuropsychological deficit, where impulsivity, as an immediate reaction to mood states, has been linked to compulsive buying (Biocalti et al., 2017; Rose & Siegrist, 2014). Jung (2017) explains reasons of greater influence are the improvement of the mood state in order to better the well-being as well as the confrontation of negative situations and emotions. Furthermore, individuals overestimate the objects' value and function as negative mood and situation relievers (David et al., 2021; Moulding et al., 2017; Müller et al., 2019).

A model that could explain this phenomenon and its interaction with impulsivity is the interaction of person-affection-cognition-execution model (I-PACE) by Brand et al. (2016, 2019) in which psychological and neurological processes behind the development and maintenance of addictive behaviours are integrated, despite it being initially designed for disorders related to the use of internet. According to Brand et al. (2019), there are general and specific factors that interact with certain environmental reinforcing maladaptive behaviours. In general, an individual can regulate their behaviour and inhibit their responses in order to avoid misconducts, and the later development of an addictive behaviour is assumed as the result of a strong associative conditioning and the loss of the ability to self-control (Brand et al., 2016, 2019). This model presumes that an imbalance between the affective and cognitive responses towards certain stimuli and an insufficient inhibitory control are associated with the addiction to specific behaviours (Brand et al., 2019). In this model, impulsivity plays a role both as a personal trait and affective-cognitive process related to the development of patters of addictive misconducts (Brand et al., 2016, 2019).

Trotzke et al., (2020, 2021) confirmed, during their investigations, that compulsive shopping involves implicit cognitive processes, craving and a poor behavioural inhibition, conforming to the description made by the I-PACE model. "Craving" is described as an irresistible desire to carry out an action as a result of a learning process during which specific stimuli are associated with a feeling of reward, that the addictive behaviour provides, and favour the occurrence of said behaviour (Starcke et al., 2018). The conditioning processes underlying the cognitive processes, such as reactivity to triggers and craving, are related to the development of other cognitive processes, including an alteration in the processing of information or particular attitudes towards the previously mentioned triggers. This explains why individuals pursue behaviours despite being aware of the harm they can cause and the description of the compulsive shopping phenomenon (Pickering et al., 2023; Trotzke et al., 2020).

Another explanatory model, oriented to shopping behaviours, is the *tripartite model of aberrant purchasing* (T-MAP) by Harnish et al. (2018), in which maladaptive behaviours associated with shopping consist of three components: cognitive self-regulation strategies while purchasing, affective reactions during the purchasing process and a behavioural response to the emotional reactions. Self-regulation is understood as the ability to plan and analyse one´s behaviour during situational changes, it would be the cognitive strategy, and implies individuals being able to regulate their behaviour in order to achieve long term goals. However, this strategy can fail despite the individual's efforts. The affective component would correspond to the sense of guilt when paying: in a purchase decision, the individual associates the product's benefits to its costs and, the stronger said association is, the more those benefits will be pursued. As a consequence, either the satisfaction can decrease due to the purchasing costs or the guilt feeling can be dulled by the benefits of buying (Harnish et al., 2018). Lastly, the desire to acquire goods beyond what is needed for one´s wellness

would represent the behavioural response, consisting of two ends in which people who buy what is strictly necessary (Spartans) and people who purchase a large number of items (Acquirers) (Preston & Vickers, 2014). These three components lead to a triangular model where, based on the exitance of a deficit or an excess in any of them, several aberrant shopping behaviours can be described. In particular, compulsive shopping is depicted as a lack of self-regulation and sense of guilt (Harnish & Roster, 2018).

Compulsive shopping often has comorbidity with other clinical disorders, being anxiety one of the most common. A correlation between higher levels of anxiety and compulsive shopping has been found among university students (Aboujaude et al., 2014; Aydin et al., 2021; González & Lemos, 2020; Harnish et al., 2019; Zhang et al., 2017). This comorbidity could be explained by the sense of pleasure or reward perceived by the individuals, contributing to its potential addictive nature. Compulsive buyers don't shop in order to acquire more products, but for the gratification felt while experiencing the shopping process itself. This way, compulsive buying would be helping to reduce stress and anxiety symptoms and people, being aware of this, would feel conditioned to perpetuate the behaviour, making it the focus of the anxiety creating at the same time more anxiety due to not being able to either do it or control it (Black et al., 2010; Davenport et al., 2012; Zheng et al., 2020).

Over the past few years, online shopping has become the first choice for a lot of consumers, given the boom of the internet and, specially, since the Covid-19 pandemic (Jaspal et al., 2020a, 2020b). Some of the reasons for choosing and using webpages as a shopping method for compulsive buyers in particular, are, namely: shopping without being seen (reducing the sense of guilt), the absence of any kind of social interaction, immediate access to a large variety of products and the experience of pleasure when buying immediately (Aboujaoude, 2014; Duroy et al., 2014; Müller et al., 2022).

It has not yet been established if online compulsive shopping equals traditional (in person) compulsive shopping or if it should be considered as a disorder related to the problematic use of internet (Müller et al, 2021b). Behavioural patterns from both types were compared and, despite their similarities, small differences were found such as those who are addicted to one modality weren't addicted to the other, which suggests they should be treated as two subcategories of a compulsive buying disorder (Ausburguer et al., 2020). The loss of control is easily enabled online due to the numerous methods in which goods can be, not only through online shops but also through in-game purchases (King et al., 2019).

Both impulsivity and anxiety are related to compulsive shopping but, following the findings of previous investigations, where anxiety is described as a state to be reduced and impulsivity as an emotional regulation strategy in response to a mood state, there could also be a correlation between the two of them as Johnson et al. (2022) suggest. Albeit the existence of studies carried out in Spain (de Sola, 2013; García-Hurtado, 2023; Martín & Prodanova, 2014), there has not

been found enough updated information about compulsive shopping from a psychological perspective or of its possible risk factors including both offline and online compulsive shopping.

Considering all the previously mentioned information, the main purpose of this study is to analyse the correlations between compulsive buying, including both online and offline modalities, with impulsivity and anxiety.

The following hypothesis are made: H1) it is expected to find a significant correlation between impulsivity and the frequency of compulsive buying behaviours, H2) higher levels of anxiety are expected to correspond to more manifestations of compulsive buying behaviours, and H3) it is expected to observe differences in compulsive buying based on age, being young adults more likely to show compulsive buying behaviours.

Method

Participants

An intentional sampling was employed using a non-probabilistic method, called the snowball method. The inclusion criteria were the majority of age, excluding those who were underaged. A total of 202 subjects participated, of whom 60.4% were women and 39.6% men, between the ages 18 and 69 years (*M*= 27.2, *DT*= 7.7) from which 46.5% belonged to the age range of 18 and 30 years. Regarding their shopping habits, offline (in person) shopping was the preferred modality by 72.8% of the participants while online shopping was the method of choice of the remaining 27.2% of the sample. Furthermore, the majority of participants whose most frequent shopping method was online shopping (27.2%), were 18 to 30 years of age, which can be explained by the recent onset of said modality and the greater use of new technologies by younger generations.

Instruments

A questionnaire was prepared and consisted of a first section for gathering sociodemographic data and the most used shopping method (online or offline) followed by the three scales used to measure the variables of interest: impulsivity, anxiety and compulsive shopping.

a) *Barrat Impulsivity Scale* (BIS-11, Patton, Standford & Barrat, 1995). It's a scale designed to assess impulsivity. It has been widely used in psychological research and validated in different populations, both in adults and teens, with adequate reliability and validity indicators. The election of this scale is justified by the fact that impulsivity measured with this instrument has correlated with several impulsive disorders. It consists of 30 items grouped in three subscales: cognitive impulsivity (Attention), motor impulsivity and non-planning impulsivity. Cognitive impulsivity implies quick decision making, while non-

planning impulsivity is characterised as a present-orientation and motor impulsivity is defined as the tendency to act. Each item has four answer options valued from 1 (rarely or never) to 4= (usually or always). The Spanish adaptation of this scale presents an adequate reliability with a Cronbach's alpha of .82 (Salinas, Aguilar-Luzón & Fabregat, 2018) and .72 in this study.

b) *Bergen Shopping Addiction Scale* (BSAS, Andreassen et al., 2015). It consists of seven Likert-type items related to the components of the shopping addiction (salience, mood change, conflict, tolerance, relapse, abstinence and problems) with answer choices ranked from 0 (completely disagree) to 4 (completely agree). According to Andreassen et al. (2014), compulsive buying is referred to as a shopping behaviour associated to an uncontrollable motivation and a cognitive effort to pursue this demeanor. In the Spanish validation, this scale obtained a Cronbach's alpha of .85 (González & Lemos, 2020), being .82 in this study.

c) *State-Trait Anxiety Questionnaire* (STAI, Spielberg et al., 1983). It´s a questionnaire to assess anxiety two components, anxiety as a trait inherent in personality and relatively stable, and anxiety as a state, transitory, characterized by an unpleasant feeling of tension and increased activity in the autonomous nervous system. The questionnaire consists of two subscales, of 20 items each, that assess anxiety as a trait (STAI-T) and state (STAI-S). In the state-anxiety subscale scores vary from 0 (never) to 3 (often) and in the trait-anxiety subscale from 0 (rarely) to 3 (nearly always). Both subscales present high internal consistency values with a Cronbach's alpha of .90 for the trait-anxiety scale and .94 for STAI-S scale (Riquelme & Buela, 2015). The reliability indicators for this study were .94 STAI-S and .91 for STAI-T.

Procedure

To select the participants, an anonymous survey, created through Google Forms, was conducted, in which at the beginning the recommendations for its completion and the guarantee of compliance with Spain's Law of Data Protection and Guarantee of Digital Rights 3/2018 are included. The form reported the voluntariness, anonymity, and confidentiality of the volunteers' participation, who signed an informed consent. For its dissemination, the form was published in various social media such as Instagram, Twitter, Facebook or Whatsapp and users were asked to share it through their profiles, creating a chain, to achieve a greater reach. This study conforms to the ethical norms for human research, in accordance with the ethical standards of the manual of the American Psychological Association (APA, 2010).

An ex-post-facto design was applied, being a cross-sectional study of quantitative, exploratory, descriptive, and correlational type.

Data analysis

The distribution of the obtained scores was verified using the Kolmogorov-Smirnov normality test (KS), after which it was concluded that the data do not follow the normal distribution, therefore, the application of non-parametric statistics was chosen.

A correlational analysis was performed using Spearman's Rho (*sr*) to study the association between impulsivity, compulsive buying, anxiety age and method of purchase and nonparametric categorical regression test to contrast the proposed hypotheses. In this regression model, compulsive buying is proposed as a dependent variable (DV) and impulsivity and both anxiety sub variables and impulsivity as independent variables (IV) in order to know their explanatory capabilities. The nonparametric Krustal-Wallis *H* test was applied to determine whether there are statistically significant differences in compulsive purchasing depending on the age of the participants.

The data analysis was carried out using the SPSS v.27 statistical program.

Results

Firstly, the Spearman correlation coefficient was used to evaluate the association between the variables. Thus, a significant correlation (r= .224, p< .05) between compulsive buying and impulsivity was found, which is indicative of the fact that higher levels of impulsivity the compulsive buying behaviours also increase.

Regarding the expected relationship between compulsive buying and anxiety, the Spearman coefficient has been significative for both state-anxiety (r= .360, p< .01) and trait-anxiety (r= .272, p< .01) This suggests that individuals with higher anxiety levels will be more likely to present a greater number of compulsive buying behaviours. Likewise, a significative positive correlation between anxiety and impulsivity was found (state anxiety= .360, trait anxiety= .366) (Table 1), meaning higher anxiety levels imply a greater number of impulsive behaviours.

Table 1

Correlations between compulsive buying, impulsivity, state-anxiety and trait anxiety

Variables	Impulsivity	Compulsive Buying	State Anxiety
Compulsive Buying	.224*		
State Anxiety	.320**	.360**	
Trait Anxiety	.366**	.272**	.664**

Notes: duplicated values were removed. *Correlation is significant at 0.05 (bilateral); **Correlation is significant at .01 (bilateral).

A non-categorical regression model was created to examine the proportion of variance in the compulsive buying scores obtained by the participants that is

explained by the impulsivity and anxiety scores. According to the results of the adjusted coefficient of determination, the set of IV explains 20.2% of the variance, a rather small percentage that may be due to the high variability of the sample. Despite this, while the trait-anxiety weight is no statistically significant, the weights of the IVs impulsivity and state-anxiety are (Table 2), therefore said variables have some explanatory capability over the DV.

Table 2

Compulsive buying categorical regression model. Initial model

Predictor variables	β	*F*	Sig.	Importance
Impulsivity	.255	5.024	.002**	.365
State Anxiety	.213	3.259	.023**	.317
Trait Anxiety	.160	1.017	.314	.129

Notes: Dependent variable: compulsive buying. **Correlation is significant at .05.

Subsequently, the same analysis was performed once more, this time only considering the significant variables, with the aim of improving the model. A second non-categorical regression demonstrated the explanatory capability of the anxiety variable as a whole on the impulsivity variable, whose results along with the adjusted non-categorical regression model are shown in Table 3.

Table 3

Corrected compulsive buying categorical regression model. Model adjustement and coefficients

Predictor variables	β	*F*	Sig.	Importance
Impulsivity	.312	10.605	.001**	.508
Total Anxiety	.306	17.866	.001**	.492
State Anxiety	.230	4.048	.019**	.456
Trait Anxiety	.266	8.290	.001**	.544

Lastly, the Krustal-Wallis *H* test was utilized to determine if statistically significant differences in compulsive buying behaviours based on the age existed. No differences were found (H= 4.776, p= .189).

Discussion

Compulsive buying is a phenomenon with a still under development research field, as concluded in several systematic review studies (see Castellanos-Alvarenga & Zapata-Antón, 2023; Iyer et al., 2020; Soto et al., 2023).

The most studied psychological factor associated with compulsive buying has been impulsivity, which presents comorbidity with mood disorders, among which anxiety stands out. According with the findings of this study, the positive and

statistically significative relation between these variables is indicated. In this regard, the study by Di Nicola et al. (2015) found that the most severe cases of compulsive buying correlated with high levels of impulsivity, a result similar to the findings of Aydin et al. (2021). Research done by Claes and Müller (2017) and Nicolai and Moshagen (2018) associated certain facets of impulsivity to compulsive buying, such as poor evaluation of the passage of time and spontaneous reaction to negative emotions (negative urgency) (see Williams & Grisham, 2012). Along the same lines, this study confirmed the existence of significant correlations between impulsivity and compulsive buying, indicating a greater presence of compulsive shopping behaviours associated with higher levels of impulsivity. This responds to shopping styles with a lack of premeditation related to sensation seeking, which result in thoughtless purchases with loss of control (Jung, 2017).

Anxiety is one of the disorders compulsive buying has been related (González & Lemos, 2020; Müller et al., 2010). This correlation was confirmed subsequent to the data analysis of this study, revealing higher levels of anxiety were associated with greater severity of compulsive buying, although the relationship is complex and could be mediated by other factors such as lack of self-control. Garcés and Salcedo (2008) stated in their investigation that a high level of anxiety is linked to personal dissatisfaction, hence the lack of self-control in spending and the few non-consumerist inducements can lead to compulsive and irresponsible buying in which impulsivity mediates. Thus, according to the results found, the proposed connection between anxiety and impulsivity has also been verified, therefore impulsivity can predict higher levels of anxiety (Johnson, 2022). However, the strength of the association and the explanatory capability were low, possibly due to the high variability of the sample and the robustness of the tests chosen for analysis.

Regarding the analysis of the differences in compulsive buying based on age, said differences have not been confirmed in this study, which may be due to the fact that almost half of the participants were under 30 years of age and from a homogeneous group. While compulsive buying has generally been associated with younger age ranges (Black, 2010; Maraz et al., 2016), other studies suggest a low age-compulsive buying correlation or an age-inverted U distribution (Kyrios et al., 2020; Ye et al., 2021). This result can be attributed to the difficulties of analysing the construct under study. This, Andreassen et al. (2015) find that the various measuring instruments developed to assess compulsive buying that are still used on the present days either lack a sufficient theoretical background or, because most were designed in the 1908s and 1990s, contain items that could be outdated for today's society. The only certainty is online modality is more frequented by younger people and the lack of control over one's own behaviour is usually higher in online shopping (Hurtado, 2023). Considering both the characteristics of the sample and the diversity of instruments used in the existing literature, it is difficult to know exactly the correlation between age and compulsive buying, as well as the determining factors. Therefore, it would be interesting to propose new studies

with a unified methodology and deepen the consensus on the definition and criteria of the issue of interest (Maraz et al., 2016; Müller et al., 2021a).

The limitations of this study rely on several factors. Firstly, the type of study: a cross-sectional study cannot make causal inferences and establish the directionality of associations. On the other hand, the small sample size and the type of sampling used don't guarantee a control on the sample nor make it representative of the population. The questionnaire and its were carried out exclusively via Internet through electronic devices, making the accessibility to the Internet and the understanding of the use of new technologies a requirement to participate and conditioning the participation of a certain part of the population. Furthermore, the understanding of the questions and items and social desirability are factors that may have influenced the responses collected and consequently, the data, results and conclusions obtained from them.

The inclusion of technology-free methods to select participants and conducting paper questionnaires should be considered, as well as adding clarifications on the meanings of certain terms used in the enunciation of items in order to facilitate the understating of the questionnaires. Moreover, other types of sampling and study, more robust methods of analysis and a larger sample size would favour a greater representativeness and adjustment of the data gathered and allow more accurate comparisons, even deepening in the differences between the two modalities and including other variables of interest such as gender or income. It would also be interesting to take isolated cases from this study whose scores on the compulsive buying scale are high and study how the variables, in their particular cases, correlate.

The practical implications of the findings obtained in this study are manifold, given the importance of elaborating on the analysis of dysfunctional purchasing behaviours. In societies with hedonic values, in which consumption has been idealized as *a representation of self-realization* (Paredes et al., 2023), preventive strategies must be promoted to try to avoid problems such as non-reflexivity in purchasing, the seduction of over-stimulation, consumption based on the avoidance of displeasure and exacerbated consumer styles. Certainly, according to Echeburúa et al. (2005), in the face of the challenge pose, one must intervene on the psychological factors of predisposition, such as impulsivity, sensation seeking, intolerance to unpleasant stimuli…, as well as emotional vulnerability, in behaviours like buying that can lead to a lack of control but are an everyday activity. Specifically, Rodríguez-Villarino (2005) advocates implementing cognitive-behavioural based psychoeducational interventions when treating shopping addiction, with a prior functional analysis of the purchasing patterns.

Among the implications related to online compulsive shopping, a current and interesting field is that of purchases in online games with the possibility of acquiring privileges in exchanges for a certain amount of money, through methods like shopping in casual, seemingly free games. Online shopping facilitates the loss of control and in this modality one can find said in-game purchases. (King et al., 2019). Educating in responsible use is the best preventive strategy, so a reduction

of emotional buying in online consumption can be promoted, according to García-Hurtado (2023), which should be enhanced by strengthening deliberative and non-compensatory motives.

In short, compulsive buying is a multi-determined problematic in which factors that define the human as bio-psycho-socio-cultural entities are involved, although in these more psychological dimensions that have been taken into consideration in this study it would be interesting to promote impulse control strategies and personal self-assertion, as well as the regulation of anxiety and its affective-cognitive symptoms (Braña & Moral, 2023; Gao et al., 2021). Comprehensive analyses shall be adopted, hence in recent systematic reviews, such as those of Castellanos-Alvarenga and Zapata-Antón (2023) and Soto et al. (2023), it is concluded that, despite the increase in research productivity, it is urged to progress in the study of factors associated with compulsive buying.

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