

Antecedents and consequences of impulse buying: a meta-analytic study

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Abstract

Purpose – The purpose of this paper is to propose a framework to distinguish between various types of antecedents and consequences of impulse buying. The authors tested it using a meta-analytical approach.

Design/methodology/approach – The authors examined 12 databases and analyzed 178 relationships in 100 articles. For the quantitative data analysis, the authors used the coefficient of correlation r as a metric to measure the effect size of the studied scope variables.

Findings – The findings of this meta-analysis demonstrated significant relation of antecedents and consequences of the impulse buying behavior, such as consumer impulsiveness ($r = 0.464$), materialistic consumption ($r = 0.344$), purchase pleasure ($r = 0.270$), hedonic value ($r = 0.311$), income ($r = 0.703$), gender ($r = 0.150$), age ($r = -0.062$), store atmosphere ($r = 0.166$), decision-making ($r = 0.703$) and positive emotions ($r = 0.323$).

Research limitations/implications – This meta-analysis reviewed relationships found worldwide in the literature, expanding and improving the current knowledge. The meta-analysis identified ways that research on impulse buying is lacking and presented suggestions for the elaboration of new studies to allow future researchers to better define their agendas.

Practical implications – This meta-analysis brings important questions, such as impulse buying behavior is associated not only with consumer impulsiveness but also with materialistic consumption.

Originality/value – This research tested the impact of the antecedents and consequences of impulse buying and presented important results through this meta-analytical review. This meta-analysis contributes to the marketing literature, with a set of empirical generalizations, including relationship coefficients and calculated fail-safe numbers.

Keyword Impulse buying

Paper type General review



1. Introduction

Impulse buying has been researched in the area of personality (Bratko *et al.*, 2013), information systems (Verhagen and Van Dolen, 2011) and marketing (Amos *et al.*, 2014). In the marketing field, researchers bring reports on occurrences of impulse buying since the late 1930s (McDermott, 1936; Converse and Mitchell, 1937; Stern, 1962). Because of the acknowledged debate around impulse buying in the field of marketing, many research studies have been carried out. This is evident in the number of quotations disclosed on Google Scholar in the seminal articles in the field, such as, for example, Stern (1962) with over 900 quotations, Rook (1987) with over 1,900 quotations and Rook and Fisher (1995) with over 1,400 quotations. In parallel to the dissemination of knowledge about impulse buying, conflicting results emerge from the literature.

One example of conflicting result resides in the relation between utilitarian value and impulse buying. Some papers suggest a positive relation (Park *et al.*, 2012) and others demonstrate a negative relationship (Dawson and Kim, 2009). In addition, there are mixed results between impulse buying and loyalty; in which some studies find positive bindings (Cole and Clow, 2011), others affirm the relation to be negative (Van Kenhove *et al.*, 2003), and yet, others point to a neutral relation (Podoshen and Andrzejewski, 2012). Some assumptions can explain these possible inconsistencies such as the different methodologies (Hedges and Olkin, 1985), sample (Pan and Zinkhan, 2006) and the cultural influence (Hofstede and Bond, 1984).

Based on these mixed results, Amos *et al.* (2014) conducted a meta-analyst study about the antecedents of impulse buying. However, the recognized contribution for the comprehension of this phenomenon, some gaps remain open. First, the analysis of impulse buying consequent behaviors was neglected, even though they are the subject of analysis in quite referred research studies in the field (Rook and Fisher, 1995; Puri, 1996). Second, recognizably important antecedent constructs were not investigated, such as, materialism (Podoshen and Andrzejewski, 2012), pleasure (Beatty and Ferrell, 1998) and circulation time (Donovan and Rossiter, 1982). Third, some important moderators, such as the size of sample (Hedges and Olkin, 1985), type of object purchased (Aggarwal and McGill, 2007) and purchase context (Park and Lennon, 2006) were not considered in the scope of analysis.

Based on these limitations, we have advanced in the research conducted by Amos *et al.* (2014), by:

- incorporating the analysis of the following consequence constructs: decision-making, loyalty and positive and negative emotions;
- enlarging the investigation of the previously mentioned antecedent constructs;
- deepening the moderators that were not previously investigated; and
- incorporating 50 new studies not tested previously.

Furthermore, this study aims to contribute for the field of knowledge of impulse buying, since, differently from a traditional review, the meta-analysis enables us to extract conclusive observations about the investigated theme from the studies that were realized in various contexts (Green, 2005) with distinct methodologies (Lipsey and Wilson, 2001). Accordingly, this study has as an objective to evaluate the antecedent and consequence of the impulse buying through the meta-analyst approach.

2. Theoretical model of the antecedents and consequences of impulse buying

Initially, impulse buying was studied in the marketing field having its concept bound to unplanned purchase (Stern, 1962), being perceived as an act of unplanned purchase by the

decision-maker (Podoshen and Andrzejewski, 2012). Some studies such as that of Rook (1987), Rook and Fisher (1995) and Youn and Faber (2000) started to bind this behavior to more subjective components of the consumer, such as affective and hedonic elements of the individual's personality. The research studies have demonstrated that impulse buying is characterized by the lack of planning. Although not all of the unplanned purchases are impulsive (Piron, 1991; Kacen *et al.*, 2012), because the unplanned purchase is characterized by a mere forgetfulness of a necessary product (Iyer, 1989), the impulse buying is motivated by a feeling that emerges from irrationality (Amos *et al.*, 2014).

Figure 1 presents the theoretical model of this study, which had as its base the systematical review realized for the meta-analyst research. In this theoretical model there were accessed for the research: 12 data basis, national and international congress proceedings and thesis and dissertations banks of the main post-graduate programs in the field of marketing and psychology. At the opportunity, all of the works that contained the term "impulse buying" in the title and/or abstract fields of the document were extracted from these sources.

In this theoretical model, we highlight that the hypothesis conception has had as a basis the minimum of three relations between the investigated constructs, which is the minimum required for the generation of tests in meta-analytic studies (Hunter and Schmidt, 2004). This procedure is widely adopted in other meta-analysis research studies (Pan and Sparks, 2012). Details of this procedures are approached in the Methodological section of this article.

From these methodological procedures, we have identified 14 constructs related to impulse buying. Of those, ten were considered antecedent behaviors, which was divided into two groups: behavioral elements (associated with individuals' characteristics) and environmental elements (characteristics linked to the purchase environment). The four remaining constructs were linked to consequence behaviors of impulse buying. Furthermore, we have listed possible moderators that could interfere in the hypothesized relations in methodological and theoretical order.

2.1 Antecedent of impulse buying

On the development of the impulse buying concept, associated elements that could precede and explain the impulsive behavior emerged from the behavioral and environmental aspects

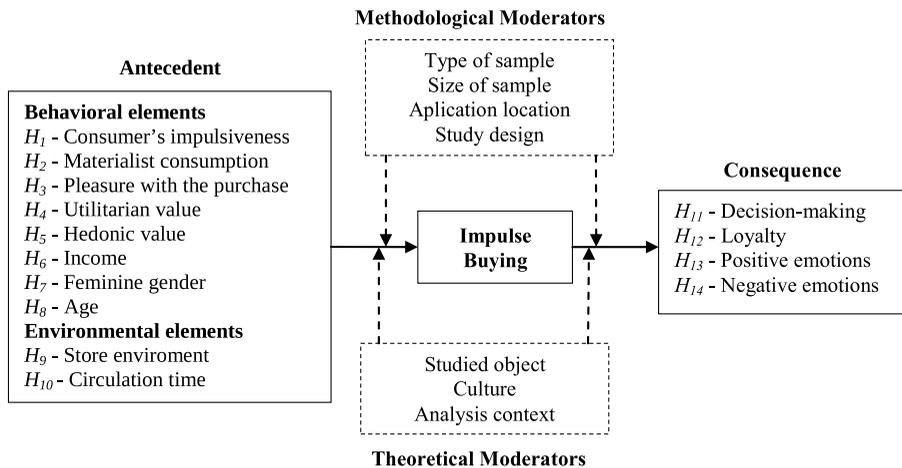


Figure 1.
Meta-analytic model
of antecedents and
consequences of
impulse buying

(Dholakia, 2000; Coley and Burgess, 2003). From the behavioral environment, there were found elements bound to the psychological and affective processes formed mainly by the irresistible propensity to purchase, positive emotion related to the purchase, humor management, cognitive decision, unplanned purchase and disregard about the future (Coley and Burgess, 2003; Youn and Faber, 2000). Therefore, the behavioral was associated with the feeling of spontaneity, lack of persistence and carefree attitude (Podoshen and Andrzejewski, 2012). In this scenery, the impulsive behavior can be guided by affective emotion (hot) and for rational cognition (cold) (Metcalfe and Mischel, 1999). Through a systematic review (see methodology), the present work has listed as an antecedent of the impulse buying eight constructs associated to the behavioral aspect, which are impulsiveness, materialist consumption, pleasure with the purchase, the perception of utilitarian value, the perception of hedonic value, income, feminine gender and consumer's age.

In the environmental context, the stimuli were generated from the environment such as, for example, the exposition to the product, the price and the illumination (Youn and Faber, 2000). In this sense, impulse buying can be influenced by marketing stimulus that incites the cognitive evaluation, leading to a need for purchasing (Beatty and Ferrell, 1998). Some examples of stimulus are sales at the store, announcements that call the attention and lightning communications (Dholakia, 2000). For this study, two antecedents were bound to the environmental context: environment and circulation time in the store.

2.1.1 Consumer's impulsiveness. The trace of impulsiveness can differ from other behaviors of consumption given to the basic aspects:

- Impulsiveness is associated with the emotional attachment to the product (Bratko *et al.*, 2013).
- Impulsiveness is related to the immediacy (Amos *et al.*, 2014).
- Impulsiveness is characterized by the lack of control that the remorse feelings cause (Floh and Madlberger, 2013).

Based on these basic aspects, one can suggest that people with these three traces are most prone to impulse buying than the individuals that do not have them (Rook, 1987; Floh and Madlberger, 2013), because they seek pleasure as it was a unique moment, without rationalizing logically about their acts and its consequences. As a consequence of these three differential traces, the impulsive are most prone to experiment the need of spontaneous, immediate and sudden purchasing, executing it with limited analysis about its consequences (Costa and Laran, 2003; Amos *et al.*, 2014). This prone, added to the capacity of not feeling immediate remorse about the decision, tends to generate the unplanned purchase. Therefore, we expect that:

H1. Consumer's impulsiveness is related positively to impulse buying.

2.1.2 Materialist consumption. Materialist consumption is related to a need of acquiring material goods, with the intention of demonstrating richness, power, and prestige (Eastman *et al.*, 1999). We believe that materialist persons seek to purchase more products and goods to demonstrate status and well-being before their partners (Banerjee and Dittmar, 2008; Santini *et al.*, 2017), elevating impulse buying. Materialist persons are oriented to material goods (i.e. cars, motorcycles, cell phones and other products) and to money, these two elements being essential to the apparent happiness of the individual (Ward and Wackman, 1972). In a study realized among Chinese, Sun *et al.* (2017) have demonstrated that the

materialism reflects on an extrinsic orientation for success, realization, richness and status in a hierarchic society.

Thus, we can assume that the materialism takes to impulse buying, which brings happiness to the consumer. The materialists spend more money than the nonmaterialist individuals (Fitzmaurice and Comegys, 2006). That way, we suggest that the materialist attitude is related positively with the impulse buying, given that this last one is a way of reaching a goal (have more status, happiness and power) (Cole and Clow, 2011). Research results consolidate this assumption (Podoshen and Andrzejewski, 2012). Then, we suggest that:

H2. The pleasure with the purchase is related positively to impulse buying.

2.1.3 Pleasure with the purchase. The pleasure with the purchase has a direct relation to the consumer's state of humor Arnold and Reynolds (2003). For example, a purchase could entail sensations like pleasure, happiness and joy (Hausman, 2000). In a pleasure context, the consumers are capable of altering a humor state from negative to positive, through the acquisition of a product (Yu and Bastin, 2010), because it would be filling in a latent need. In fact, the individuals see the purchase as a personal stress self-treatment artifice (Rook and Gardner, 1993). In many cases, the purchase act is a relief device that generates a better humor (Wolman, 1989), because purchase stimulates positive perceptions of an store environment, and, consequently, raises the permanence time there, which could initiate impulsiveness behavior (Heilman *et al.*, 2002). This way, it is suggested that:

H3. The pleasure with the purchase relates positively to impulse buying.

2.1.4 Perception of the utilitarian value. Consumers frequently seek to receive detailed information about the products before they purchase specific objects, such as, color, capacity, design and size (Park *et al.*, 2012). This rational detailing of the attributes and characteristics can be grouped under the label of "utilitarian functions" (Kim and Knight, 2007). Thus, the perception of the utilitarian value of consumption is bound to the cognitive and rational experiences. On the other hand, impulse buying is considered an unexpected, sudden and pleasurable behavior of hedonic nature. In this case, because of the speed, which is a characteristic of the decision-making process of impulse buying, the consumer does not take into consideration the rational benefit presented and nonetheless evaluate the existent alternatives in a careful and rational way (Park *et al.*, 2012). In this case, an inverse relation among these behaviors can be observed, according to what was already demonstrated by the studies of Dawson and Kim (2009). Thus, it is suggested that:

H4. The perception of utilitarian value is related negatively to impulse buying.

2.1.5 Perception of hedonic value. The perception of hedonic value is a facet of the consumer's behavior that is associated directly with multisensory and emotive experience of consumption (Holbrook and Hirschman, 1982). The hedonic value involves sensory modality such as tact, taste, smell and sound, including the imaginary for the production of emotional excitement (Tifferet and Herstein, 2012). Given such conditions, these individuals can purchase more and more products. The hedonic value seeks, in a certain way, the satisfaction of an expressed desire of consumption centered in the experience (Miller, 2000). The search for the hedonic value can be considered a strategy of suppression that is susceptible to conduct the consumer to a bigger need of humor improvement or repair of some necessity (Gross, 2002). Because impulse buying is a way of emotional self-regulation, we expect that both constructs are associated positively (Tifferet and Herstein, 2012). Babin *et al.* (1994) suggest that the individuals possess a more hedonic orientation when they are in

a recreational stage of purchasing, and, with that, can act in a more impulsive way. The recreation tends to favor the impulse buying, because recreation makes the individual more humorous, facilitating the acquisition process. Then, we propose that:

H5. The perception of hedonic value is related positively to impulse buying.

2.1.6 Consumer's income. The concentration of income in some families can generate a rise in unplanned purchasing (Tifferet and Herstein, 2012), as well as planned purchasing. This means that a bigger availability of financial resources generates a prone to purchase (Jeon and Vonfurstenberg, 1990), increasing consumption. Given that impulse buying is exercised without a form of self-regulation – being perceived as dysfunctional (Jones, 2003) and considered that the concentration of income increases the possibility of an acquisition – it is expected that the bigger the income, the bigger the probability of impulse buying. That way, we believe that:

H6. The consumer income is related positively to the impulse buying.

2.1.7 Feminine gender. The segmentation by gender (masculine *vs.* feminine) has been the object of communication and segmentation strategy on market for a long time (Schmitt *et al.*, 2008), essentially because in some cultures women and men have different social roles and personality traces (Tifferet and Herstein, 2012) that impact the act of consuming (Dholakia, 2000). Studies indicate that women spend more time in purchasing than men (Fischer and Arnold, 1990). Moreover, women are more detailed when processing information from the publicity of the products (Kempf *et al.*, 2006). Therefore, women are expected to have more inclination into purchasing than men. Research points that women (*vs* me) encounter more pleasure and spend more time and energy in the activity of purchasing (Dholakia, 2000), being, then, more receptive to catch stimulus that can result in impulse buying (Rook and Hoch, 1985; Coley and Burgess, 2003). These characteristics can be the mechanisms by which the women tend to have more inclination to impulse buying, objectifying more enchant and personal satisfaction. This way, we expect that:

H7. The feminine gender relates positively to impulse buying.

2.1.8 Consumer's age. Diverse research points out that the transition from adolescence to the adult phase is marked by the search for self-identity and social insertion (Yang *et al.*, 2008), being that search, many times, represented by the act of consumption (Niu and Wang, 2009). We believe that the young seek for products that satisfy the references and styles of their reference groups, increasing the desire for purchase. In the sense of satisfaction, differently from an adult, which not necessarily needs to affirm itself in a group, the young can be evaluated by its peers all the time, which would lead them to increase the purchase to satisfy the judgment of the colleagues (Ladeira *et al.*, 2016). Davis and Havighurst (1946) point out that the impulsive characteristics are learned and developed in the first years of life, fact empirically proven in recent studies (Niu and Wang, 2009). Then, the younger the age, the bigger the impulse buying, which can be verified by the study by Lai (2010). This way, we suggest that:

H8. The age of the consumer is related negatively to impulse buying.

2.1.9 Store environment. Studies have demonstrated a positive relation between the store environment and consumer's emotions because these emotions tend to increase the possibility of realizing impulse buying (Rook and Fisher, 1995). A more elaborated environment tends to increase the added value of the product, subliminally suggesting a

purchase (Mallalieu and Palan, 2006). Besides that, a more elaborated environment can generate positive and pleasant feelings, facilitating the unplanned purchase. The study of Donovan and Rossiter (1982) points out that the environment of the store is related to the time of permanence in the store and the predisposition for the realization of impulse buying. Piron (1991) pointed that colors, sounds, persons and textures are trigger elements for impulsive behavior (Mitchell, 1994). Empirically, research has supported the environment assumption in a more consistent way (Davis and Sajtos, 2009). From there, we expect that:

H9. The environment of the store is related positively to impulse buying.

2.1.10 Circulation time. Studies by Donovan and Rossiter (1982) and Heilman *et al.* (2002) have pointed out that the greater the time of circulation in a store, the greater the probability of realization of impulse buying. This relationship occurs because the consumers that remain more time in an environment are more susceptible to receive the stimulus presented in this environment (Heilman *et al.*, 2002). The consumers also are more prone to find products that were not in their planning, and, with this, realize more impulse buying (Donovan and Rossiter, 1982). Thus, marketing professionals might stimulate impulse buying from the conception and the investment in strategic conditions in the store's atmosphere (Floh and Madlberger, 2013). Thus, we propose that:

H10. The circulation time in the store is related positively to impulse buying.

2.2 Consequence of impulse buying

The importance of the identification of the consequence occasioned by impulse buying is highlighted since the seminal concept of Rook (1987), which suggests a consumers' disregard for the consequences of such behavior. The line of investigation of the consequence follows two distinct paths. The first path assumes the behavior of impulse buying as something irrational and immature, while the second path associates impulse buying to a self-realization activity (Rook and Fisher, 1995). In the first path, there is the tendency of having negative consequences of the behavior, while in the second one there is the prediction of emerging positive aspects based on the experience, which takes to contentment and satisfaction (Hausman, 2000). Following, we will present the four consequence constructs that emerged from the systematic review.

2.2.1 Decision-making. The impulse buying is directly associated with the consumer's decision-making (Rook and Fisher, 1995). The greater the probability of realizing an unplanned action, the greater the possibility of taking an impulsive action. Studies that detect strong relations between the impulse buying and the decision-making are observed in distinct segments, such as the hiring of financial services (Lai, 2010) and actions of sales (Fenech, 2002). Reinforcing, even more, the relation between impulse buying and decision-making are being found in studies realized in Western (Fenech, 2002) and Eastern countries (Ling *et al.*, 2010). From there, we suggest that:

H11. Impulse buying is related positively to consumers decision-making.

2.2.2 Loyalty. There is the assumption that loyalty because of impulse buying facet has as base the materialism (San-Martin and López-Catalán, 2013). Impulse buying brings the sensation of realization of a pleasurable purchase and, as a consequence, impacts in positive evaluations of the companies (Cole and Clow, 2011). We suggest that impulse buying generates the attendance or even the enchantment of an expectation (Oliver, 1999) that can be unconscious and conscious (Laran and Janiszewski, 2009), once that the purchase was not

elaborated previously. As a consequence, the consumer starts frequenting a determined store and may, in turn, develop a loyal behavior from the sensation of pleasure occasioned by the consumption (Cole and Clow, 2011). This way, the greater the impulsive behavior, the greater the loyalty of a consumer to a company (San-Martin and López-Catalán, 2013). For this reason, we understood that:

H12. Impulse buying is related positively to the loyalty to the company.

2.2.3 Positive and negative emotions. The relation between impulse buying and the emotional consequence is paradoxical. Theoretical arguments suggest a positive effect between impulse buying and positive emotions (Hausman, 2000; Costa and Laran, 2003), and there are also arguments, however, that present a positive bound between the impulse buying and the negative emotions (Rook and Fisher, 1995). This paradoxical interpretation makes sense, taking into account that the impulse buying can generate feelings positively bound to pleasure (Cole and Clow, 2011) or to regret (Hausman, 2000), to happiness (Rook and Fisher, 1995) or to the feeling of guilt (Costa and Laran, 2003). In this sense, the research that positively associates impulse buying with positive emotions relates with the elements of self-esteem and self-realization (Hausman, 2000), while the positive relation of impulse buying and negative emotions is based on the feeling of consumption rationalization, leading to a possible frustration (Rook and Fisher, 1995; Costa and Laran, 2003). This way, we assume the following hypothesis:

H13. Impulse buying is related positively to positive emotions.

H14. Impulse buying is related positively to negative emotions.

3. Methodological design

We did a desk research review, which is characterized by a bibliographical search of secondary data in published works/papers. This meta-analysis adopts the register protocol, suggested by Moher *et al.* (2009) and Vieira (2017), in which there were included the eligibility criteria for specifying the characteristics of the study. These characteristics involved:

- definition of the information sources;
- collecting process and researched variables; and
- data and result in combination manipulation methods.

3.1 Search systems

The data collecting initiated with the definition of the information sources and involved 12 data basis, being: Jstor, WorldCat, Emerald, DOAJ, PsycINFO, Taylor and Francis, Elsevier Science Direct, SCOPUS, Proquest, Scielo, Google Scholar and EBSCO. Besides, with the intent of covering the gray literature – unpublished or working papers – there were realized searches in marketing conferences in Brazil and in the USA, such as *Encontro de Marketing da Anpad* (2004-2016), *Encontro da Associação Nacional de Pós-Graduação em Administração* (1997-2013) and Association for Consumer Research. There were also collected works in thesis and dissertations of the main post-graduation programs in marketing and psychology, from countries of English, Portuguese and Spanish languages (CAPES database). The search for gray literature is important because of the recurring criticism of the academy in respect to the overestimation of the effects in the works that are

published in journals (Rosenthal, 1979; Lipsey and Wilson, 1993; Uttley and Montgomery, 2017).

3.2 *Collecting process and variables*

The search indicators had the term impulse buying (Portuguese: *compra por impulso*; Spanish: *impulsividad*) in the title and abstract fields of the documents in the search tools of the data basis.

At the initial phase of collecting, 237 works were selected. There were observed that 137 works could not be part of the final sample because they did not generate quantitative data, although, they could be used for the understanding of the relations. Of those, 14 were of qualitative nature and 123 did not present adequate constructs to the objective of this study because it involved two or fewer studies for the supposed relations with the impulse buying. From that purification, it came to a final sample composed of 100 articles, which generated 178 valid observations for the analysis of this work. [Appendix 1](#) presents a synthesis of the characteristics of the studies utilized in this research.

3.3 *Data codification*

For the study codification, the following elements were used: work titles, journals, authors, publication years, statistic index of the studied relations, reliability index and number of variables of the applied scales, besides the mapping of the type of sample (students vs non students), research location (laboratory vs field), research nature (survey vs experimental), size of sample, study object (product vs service), analysis context (physical vs virtual) and country of origin of the research application.

For the data codification, the same procedures adopted by [Ladeira et al. \(2016\)](#) and [Vieira \(2017\)](#) were followed, which allowed that each article was doubly revised. It is highlighted that there are yet some other important aspects in relation to the data codification, which aimed to give more reliability to the development of the systematic review ([Uttley and Montgomery, 2017](#)):

- The researchers responsible for the data codification possess previous experiences in systematic review, as they developed various meta-analysis in the past years.
- Before the beginning of the extraction process, there was a meeting for the methodological convention and alignment of the aspects to be extracted from the articles.
- After the completion of the works, there was a new meeting for the presentation of the results obtained by each researcher.

In this opportunity, there was observed 95 per cent of consistency between the extractions made by the researchers, two of them are the ones who realized the extraction and the third one, who was a judge for the establishment of a consensus. It is highlighted that the third researcher also has wide experience in methodology.

After this phase, there were identified, from the data codification, ten antecedents and four consequence constructs. The constructs emerged from the systematic review realized and from the minimum number necessary of effect-sizes for the realization of the meta-analytic analysis ([Hunter and Schmidt, 2004](#)). [Table I](#) presents the definition of each construct used.

For the data analysis, a correlation coefficient r by Pearson was used as a metrical variable to measure the effect-size over the variables of the studied scope ([Vieira, 2017](#)). For the studies that did not report the correlations coefficient, the statistic presented, such as

β -values, f -test, χ^2 , t -test and z -test, were transformed into correlations coefficients, procedure recommended by Hedges and Olkin (1985) and used in another meta-analysis (Pan and Zinkhan, 2006; De Matos and Rossi, 2008; Rosario *et al.*, 2016).

The meta-analytic research can be analyzed from two models: the fixed model and the random model (Hunter and Schmidt, 2004). In the case of the fixed model, a unique and true value of the effects between all of the studies is assumed, disregarding, then, the heterogeneity of the samples (Borenstein *et al.*, 2007). On the other hand, in the random model, there is the tolerance for the variation of these effects (Hunter and Schmidt, 2004). For this study, the random effect of the effect-size method was used, as random effect is the adequate method for this research given the amplitude of the collected studies (Hunter and Schmidt, 2004) and used in other meta-analytic research (De Matos and Rossi, 2008; Rauch *et al.*, 2016).

Considering the variability of the analyzed studies, the following calculus was realized: sample errors, measure errors, confidence interval and heterogeneity degree. Concerning the calculus of the sample errors, the effect sizes were adjusted from the effect size divided by the size of the sample. The measured error considered the effect size divided by the square root of the analyzed constructs confidence. The inferior and superior confidence intervals indicate the variation on the effect sizes average in the studies. We used the following formula for confidence interval [$ES_{average} \pm 1.96(DP_{ES})$]. The heterogeneity degree was

Antecedent	Concept	Reference
Consumer impulsiveness	Trace of personality aligned to emotional attachment, immediacy, and lack of control	Puri (1996)
Materialist consumption	Consumption aimed at the demonstration of possessions, power, prestige and status	Eastman <i>et al.</i> (1999), Cole and Clow (2011)
Pleasure with the purchase	Emotions that emerge from the purchasing activity	Rook and Gardner (1993), Arnold and Reynolds (2003)
Utilitarian value	Consumption guided by cognitive and rational reasons	Holbrook and Hirschman (1982)
Hedonic value	Consumption bound to sensory and emotive elements	Holbrook and Hirschman (1982)
Income	Financial gains obtained by the individual that tends to unchain the consumption	Yang <i>et al.</i> (2008), Tifferet and Herstein (2012)
Feminine gender	Gender for which there are found biggest incidence of pleasure, time and energy to exercise the purchasing activity	Dholakia (2000)
Age	Age range of the individual that can bind to the self-affirmation consumption	Yang <i>et al.</i> (2008), Niu and Wang (2009)
Store environment	Environment in which the purchase is accomplished	Donovan and Rossiter (1982)
Circulation time	Time spend in the purchasing environment	Donovan and Rossiter (1982)
Decision-making	Consumption act that can lead to unplanned or planned actions	Rook and Fisher (1995)
Loyalty	Deep compromise with buying or using a product or service in a consistent way in order to repeatedly provoke purchases on the same brand or company	Oliver (1999)
Positive emotions	Positive feelings resulting in consumption	Costa and Laran (2003, 2006), Park <i>et al.</i> (2012)
Negative emotions	Negative feelings resulting in consumption	Costa and Laran (2003, 2006), Park <i>et al.</i> (2012)

Table I.
Definition of the
constructs concepts

found from the Q test by Cochran from the following calculus: $Q = \sum_{wi} ES^2_i - (\sum_{wi} ES)^2 / \sum_{wi}$. These procedures are suggested by Hedges and Olkin (1985) and Hunter and Schmidt (2004). Methodological moderators that could be influencing the force of the effect sizes were analyzed and adjusted (Hunter and Schmidt, 2004). In this case, the possible moderator effects of the type and size of the sample, location of the research application and study design were evaluated.

Finally, it is also highlighted that, for the significant relations, the index of the fail-safe number was calculated. Fail-safe estimates the number of non-significant or unpublished studies that are necessary to refute the findings in this research (Rosenthal, 1979). For this calculus, the formula $[k((r/0.05) - 1)]$ suggested by Rosenthal (1979) was used. This analysis allows to evaluate if the effect observed in the relations is sufficiently robust (Borenstein et al., 2009). In fail-safe, the higher the result, the higher the robustness of the finding. This parameter is used in the meta-analyst studies (Rauch et al., 2016; Santini et al., 2016). The data analysis was based on the Comprehensive Meta-Analysis 2.0 Software version (Borenstein et al., 2005).

4. Results

Following, the results obtained in this meta-analysis are presented. We start with the descriptive analysis followed by the theoretical model and, in the end, the methodological and theoretical moderators.

4.1 Descriptive analysis

Works published between the years 1998 until 2015 were found. The total collected sample of the studies was of 866,379 (minimum = 40 and maximum = 109,472) subjects. The index of confidence of the construct impulse buying vary between $\alpha = 0.525$ and $\alpha = 0.965$, generating a weighted average of $\alpha = 0.819$. We did not find an association between the sample size and the year of publication of the article ($r = 0.10$; $p = 0.20$); neither there was observed a significant correlation between year of publication and index of Cronbach reliability ($r = 0.14$; $p = 0.16$).

4.2 Theoretical model analysis

Table II presents a synthesis of the results obtained with the meta-analysis. In *H1*, a positive and significant relation between the impulsive characteristics of the consumer and the impulse buying was expected. The results sustain the hypothesis ($r = 0.464$; $p < 0.001$). There is an elevated number of 26,226 articles needed to reject the relation (*fail-safe drawer*).

The results presented also corroborated with *H3*, confirming the assumption that the purchasing act is a way of decrease the stress level (Rook and Gardner, 1993) and improve the humor (Wolman, 1989), as a consequence, it can generate impulse buying. *H2* predicted that the materialist attitude of the consumer would relate positively to the impulse buying. The assumption is theoretically based on Fitzmaurice and Comegys' (2006) study. This relation is confirmed ($r = 0.344$; $p < 0.001$; *fail-safe drawer* = 958). The results presented also corroborated with *H3*, reinforcing the assumption that the activity of purchasing can be a way of relieving the stress (Rook and Gardner, 1993) which improves the humor (Wolman, 1989) and, as a consequence, can generate impulse buying. There was a positive and significant relation between pleasure with the purchase and impulse buying, as expected ($r = 0.270$; $p < 0.001$; *fail-safe drawer* = 1,040).

H4 and *H5* predicted, respectively, a negative relation in the utilitarian value and a positive relation of the hedonic value with the impulse buying construct. The relation

Constructs	Relation	(k)	(o)	N	Minimum	Maximum	Simple average	Weighted average N	Weighted average α	sig ₁	ICI (95%)	ICS (95%)	Q	sig ₂	Fail-safe drawer
<i>Antecedent</i>															
H1	Consumer's impulsiveness	26	32	16,477	0.000	0.650	0.324	0.382	0.464	0.000	0.18	0.75	355.81	0.000	26,226
H2	Materialist consumption	8	8	3,222	0.123	0.565	0.296	0.289	0.344	0.000	0.25	0.45	52.03	0.000	958
H3	Pleasure with the purchase	8	9	3,266	0.010	0.623	0.271	0.233	0.270	0.000	0.10	0.43	156.38	0.000	1,040
H4	Utilitarian value	6	6	2,379	-0.551	0.620	0.030	0.172	0.207	0.866	-0.21	0.67	458.31	0.000	NC
H5	Hedonic value	10	10	112,932	0.000	0.680	0.312	0.278	0.311	0.000	0.28	0.35	337.25	0.000	9,504
H6	Consumer's income	9	11	220,954	-0.024	0.275	0.128	0.053	0.056	0.000	0.05	0.06	33.74	0.002	967
H7	Feminine gender	11	13	223,690	0.033	0.691	0.195	0.142	0.150	0.000	0.13	0.17	432.96	0.000	9,618
H8	Consumer age	16	19	225,110	-0.061	0.222	-0.119	-0.060	-0.062	0.000	-0.09	-0.04	706.13	0.000	3,358
H9	Store environment	11	12	10,997	0.024	0.784	0.258	0.138	0.166	0.000	0.07	0.26	204.19	0.000	2,475
H10	Circulation time	9	10	10,120	-0.040	0.670	0.153	0.025	0.112	0.068	-0.03	0.09	72.24	0.000	NC
<i>Consequence</i>															
H11	Decision-making	21	32	15,486	0.129	0.872	0.443	0.628	0.703	0.000	0.64	0.89	2724.82	0.000	35,899
H12	Loyalty	4	5	2,791	-0.080	0.118	0.008	0.003	0.007	0.254	-0.16	0.17	14.95	0.004	NC
H13	Positive emotions	5	6	9,340	0.040	0.330	0.235	0.272	0.323	0.000	0.25	0.39	51.74	0.000	1,274
H14	Negative emotions	4	5	9,612	0.000	0.080	0.030	0.029	0.034	0.056	0.00	0.06	6.36	0.272	NC

Notes: (k) number of studies used for the analysis; (o) number of observations extracted from the studies for the analysis; (N) number of samples collected from the evaluated studies; (min) minimum simple correlation found in the studies; (max) maximum simple correlation found in the studies; (simple average): simple average of the correlation found in the studies; (weighted average N): simple and corrected weighted average of the correlation extracted from the studies; (weighted average α): weighted average corrected from the sample alpha obtained in the studies; (sig₁): significance degree of the effect size; (ICI): low confidence interval; (ICS) high confidence interval; (Q): heterogeneity test at individual and aggregated level; (sig₂): Q significance degree; (fail safe drawer): number of articles needed for the result to be false (Rosenthal, 1979); (NC): not calculated

Table II.
Meta-Analysis
results

between utilitarian value and impulse buying is not significant, and, then, does not corroborate with *H4*. In relation to *H5*, the results support the confirmation of the hypothesis ($r = 0.311$; $p < 0.001$; *fail-safe drawer* = 9,504), in consonance with the study by Tifferet and Herstein (2012). The hypothesis proposed a positive significant relation between the consumer's income and the impulse buying. The results found support the hypothesis ($r = 0.056$; $p < 0.001$; *fail-safe drawer* = 967). A more elevated income tends to generate an increase of the impulse buying, given the bigger capacity of buying and paying (Tifferet and Herstein, 2012).

H7 predicted that the feminine gender possesses a positive relation with impulse buying (Coley and Burgess, 2003). The results support the hypothesis ($r = 0.150$; $p < 0.001$; *fail-safe drawer* = 9,618). Yet, *H8* predicted a negative bound of the impulse buying with age, once that the younger consumers demand more consumption and, consequently, are more materialist. The results confirm the hypothesis ($r = -0.062$; $p < 0.001$; *fail-safe drawer* = 3,358). *H9* suggested a positive and significant relation of the environment with the prone to impulse buying. The data obtained presented an expected result with effect-size of $r = 0.166$ ($p < 0.001$; *fail-safe drawer* = 2,475), reinforcing the findings of Costa and Laran (2003). *H10* predicted that the circulation time in the store possesses a positive relation with the impulse buying. The hypothesis was not confirmed ($r = 0.112$; $p = 0.068$), because the significance level was not completely reached. However, the relation can be considered marginally significant, given the proximity of the tolerable index (5 per cent) for the rejection of the null hypothesis (Schlotzhauer, 2007).

In regard to the consequence of the impulse buying, four hypotheses were presented. The first of them (*H11*) expected a positive relation with the consumer's decision-making. The results confirmed the relation with force of $r = 0.703$ ($p < 0.001$; *fail-safe drawer* = 35,899). Figure 2 presents a general vision of the relation between impulse buying and decision-making, through the forest plot.

In *H12*, the assumption was that the impulse buying would relate positively with loyalty to the company. We found that the relation was not significant ($r = 0.03$; $p = 0.254$). This way, *H12* is rejected.

H13 expected a positive relation between impulse buying and the positive emotions. The results found confirm the assumption ($r = 0.323$; $p < 0.010$; *fail-safe drawer* = 1,274). There is, thus, a positive affective state felt by the consumer after the unplanned purchase (Costa and Laran, 2003). In the end, *H14* predicted a positive relation between the impulse buying and the negative emotions. The results, in this case, do not support the relation ($r = 0.034$; $p = 0.056$).

4.3 Analysis of the moderator effects

The regression analysis was realized with the objective of verifying if the methodological and theoretical variables could increase the existent relations between the antecedent and consequence of impulse buying. The realization of that analysis followed the criteria indicated by Lipsey and Wilson (2001) and Araujo *et al.* (2016). This analysis was only realized in the following situations:

- when the statistics *Q* of heterogeneity was superior to 25 per cent (Table II);
- when the number of observations was equal or superior to 10 effect-sizes; and
- when the relation of the impulse buying and the investigated construct was significant.

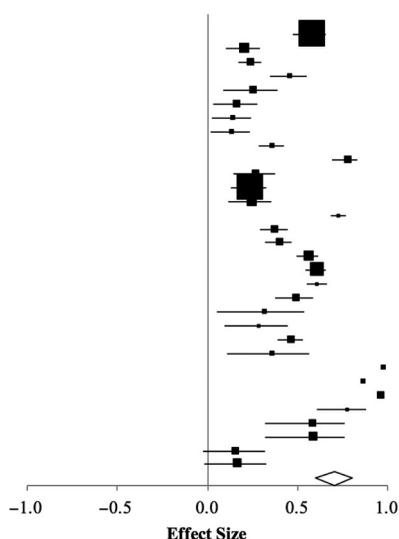


Figure 2.
Forest plot between
the impulse buying
and the decision-
making

Then, there was realized the test of moderator effect in the relations between the following antecedents: consumer's impulsiveness, hedonic value, income, feminine gender, consumer's age and the consequence consumer's decision-making.

First, the test was applied to verify the possible influence of the type of sample on the effect-size produced. We expect that the samples of the students would provide stronger effect-sizes, since that this possesses a characteristic of homogeneity (Pan and Zinkhan, 2006). Significant relations with the type of sample were not found in the relations between the constructs: impulsiveness, consumer's income and age and the behavior of impulse buying. In counterpart, significant relations for the moderator effect of the type of sample in the relations between hedonic value was detected [$\beta = -0.352$; $t(9) = -3.441$; $M_{hedonic_student} = 0.48$; $M_{hedonic_nonstudent} = 0.13$; $p < 0.009$]; feminine gender [$\beta = -0.262$; $t(12) = -3.131$; $M_{feminine_student} = 0.23$; $M_{feminine_nonstudent} = 0.09$; $p < 0.010$]; and decision-making [$\beta = 0.217$; $t(31) = 2.679$; $M_{decision_making_student} = 0.56$; $M_{decision_making_nonstudent} = 0.34$; $p < 0.012$]. In these cases, the effect-sizes produced were always higher for the sample composed of students. This way, we partially corroborated the assumption by Pan and Zinkhan (2006), which suggest that the homogeneity characteristic of the student's samples is present in approximately 75 per cent of the published articles in the social psychology (Gordon et al., 1986) and tends to generate more strong effect-sizes. There is an academic discussion regarding the utilization of students in academic research (Wells, 1993; Winner, 1999). Studies that use student sample tend to produce significant effect-sizes from its external validity (Winner, 1999); but hardly as a power of generalization, against to its limitation in terms of external validity. Taking this theoretical line as a support, it is important to reflect about the relations of the impulse buying with the hedonic value and the feminine gender, in view of the non-significant effects found in non-student samples.

Following, the possible moderator effect in the size of the sample was tested. Then, the sample was considered as big or small. This separation was because of the average of the effect-sizes (impulsiveness = 0.387; hedonic value = 0.328; consumer's income = 0.328; feminine gender = 0.358; consumer's age = 0.279; store environment = 0.234; decision-

making = 0.279). Our assumption is that the studies with small samples present stronger effect-sizes, studies with samples with these characteristics tend to overestimate the referred effect (Hedges and Olkin, 1985). We rejected such assumption, as no significant difference was found in the analyzed relations.

In relation to the type of study, two categories were established: laboratory and field. It is possible to assume that the effect-sizes produced in a real context have less power of explanation than in an artificial environment (Fern and Monroe, 1996). This assumption was partially confirmed. We find positive relation only between hedonic value and impulse buying [$\beta = 0.301$; $t(9) = 2.401$; $M_{hedonic_field} = 0.13$; $M_{hedonic_laboratory} = 0.43$; $p = 0.043$], being congruent with the proposal by Fern and Monroe (1996) that the laboratory studies overestimate the effect-sizes from the possibility of controlling the strange variables.

Following the moderation analysis, the variable type/design of the studies was evaluated. In this case, the studies were classified as experiment or collection. In experimental studies, it is common to find the higher power of explanation of the effect-sizes, once that these studies allow bigger control of the sceneries for different groups (Hedges and Olkin, 1985). Again, no significant relations were found. It is highlighted that in this case, only analysis of the relations between impulsiveness and impulse buying was effected, as well as between impulse buying and decision-making. In other situations, the insufficient number of works for the analysis of variance has impeded the evaluation.

After the analysis of the methodological moderators, the theoretical moderators were analyzed, such as study object (product vs service), culture (Western vs Eastern) and analysis context (physical vs virtual). The conception of the studied object was because of the separation of the research that had as analysis focus the evaluation of products or services. We assume that research in which the object was a product tends to produce stronger effect-sizes than the ones that investigated services because products are characterized as more homogeneous than services (Parasuraman *et al.*, 1985). The results of the analysis were not sufficient for confirming this assumption. Again, and for the same reasons mentioned previously, only the analysis between the impulsiveness and the impulse buying were effected, as well as impulse buying and decision-making.

Following, the moderator effect of the culture over the suggested relation was analyzed. For this research, the separation of culture was by the country that was the object of analysis, classified as Western or Eastern. The Western culture is considered more collectivist, while the Eastern culture is more individualist (Gudykunst, 1993). In the collectivist culture, people see themselves inserted in a group that seeks the well-being of all (Hofstede and Bond, 1984). In opposition to that, in the individualist culture, the predominance is of immediacy, in which the autonomy and independence are a priority (Hofstede and Bond, 1984). From there, it is possible to assume that the eastern are less prone to impulse buy than the western (Pornpitakpan and Han, 2013). Besides the presented arguments, the results were not significant to the point of confirming the proposal and, thus, it was not possible to find stronger relations of antecedent constructs and consequence to the impulse buying in western consumers.

Finally, the last moderator variable tested was the context of the analysis of impulse buying (physical vs virtual). A significant relation of the moderator effect of the context of analysis between impulse buying and decision-making was observed, and the effect-sizes were superior in research applied in physical environments [$\beta = -0.240$; $t(31) = -2.090$; $M_{decision-making_physical} = 0.48$; $M_{decision-making_virtual} = 0.24$; $p < 0.045$]. In the other tested relations, there were no significant differences from the moderator effect of the context of analysis of purchase. This way, the assumption that the physical environment could provoke stronger effect-sizes because of the bigger exposition of the

consumer to the context influences is partially corroborated (Park and Lennon, 2006; Costa and Laran, 2006).

5. Final considerations

This work proposed and studied a framework of the antecedent and consequence of the impulse buying through a systematic and meta-analytic review. The results found incorporate new antecedents and consequences for understanding the relations originated by the impulse buying, bringing new contributions to the marketing field of research. First, this study related to the antecedent constructs of the impulse buying, that were presented in two distinct approaches, being one environmental and other behavioral. In relation to the behavioral elements that bound positively with the prone to the realization of impulse buying (Rook, 1987; Rook and Fisher, 1995), characteristics of impulsiveness, materialist consumption, pleasure with the purchase, perception of the hedonic value, income and feminine gender were found. The age construct presented an inverse relation with impulse buying. The stronger relation presented in this behavioral dimension is the relation between the impulsive characteristic and impulse buying ($r = 0.464$). Besides that, the findings allow consolidating that the influences linked to the environmental dimension also act on impulse buying (Dholakia, 2000; Youn and Faber, 2000). In this ambit, it is included the aspects bound to price and the store environment.

Second, it examined the relations between impulse buying and its consequences, which lead us to confirm the relations between impulse buying and the consumer's decision-making and the post-purchase emotions. In regard to the decision-making, a strong relation with impulse buying was observed, reinforcing that consumers that possess behavior of impulse buying tend to repeat this behavior in the future (Fenech, 2002; Lai, 2010). In addition, the significant relation between impulse buying and loyalty was not verified. For the post-purchase emotions, it was observed that impulse buying exercises significant and positive effect in what regards the positive emotion.

Third, the contribution for the field of research refers to the analysis of the moderator's variables that could affect the homogeneity of the effect-sizes. The relations between the impulse buying and some antecedents (impulsiveness, hedonic value, income, feminine gender and age) and another consequence (decision-making) were examined. In this case, partial support for some of the moderator effects suggested was found. We found that the sample of students and applications of laboratory overestimate the effects of some relations. On the other hand, in the ambit of theoretical moderators, we partially corroborated the assumption that research application in the physical environment would provoke stronger effect-sizes than in the virtual context (Park and Lennon, 2006; Costa and Laran, 2006).

Fourth, the study is about the evolution of the knowledge of impulse buying from the incorporation of 50 new research studies that were not analyzed in the scope of Amos *et al.* (2014). Our study advances in terms of knowledge, presenting new antecedent constructs (materialism, pleasure and circulation time) and moderators (sample size, type of purchased object and context analysis). As well, we show four new consequence constructs (decision-making, loyalty to the company, positive emotions, and negative emotions) whose importance is highlighted since the 1980's, centered in the search of understanding about the positive and negative resulting consequences of impulse buying (Rook, 1987). Besides that, it is also highlighted the inclusion of consequence constructs (decision-making, loyalty to the company, positive emotions, and negative emotions) whose importance is highlighted since the 80's, centered in the search of understanding about the positive and negative resulting consequences of impulse buying (Rook, 1987).

This paper contributes to a better understanding of impulse buying because the meta-analytic research, differently from the traditional review, can extract conclusive observations about the investigated theme, from the realized studies in various contexts (Green, 2005). Additionally, the meta-analysis surpasses the possible biases associated with the research that is realized and published with different limitations (for example, size and type of sample and methodological robustness), allowing it to generate precise estimation of the effect-sizes in each analyzed relation (Hedges and Olkin, 1985) and, still, allow to come to conclusive precision, differently from any other primary study (Hunter and Schmidt, 2004).

For the managers, the results of this meta-analysis bring important questions, which should be analyzed carefully when promoting the impulsiveness in the act of consumption. For example, the results obtained in this study lead us to believe that the promotional campaigns or the strategic displays of products that express materialist or hedonic values will probably generate impulse buying. These kinds of actions tend to influence people that already are prone to impulse buying, making the consumers be more proactive making consuming decisions concerning choosing the products that are in this strategic scope. Besides, and converging with the constant investments realized in the market, the store environment was detected as a forwarder of the impulsive behavior. This fact can be increased in segments of higher income, in relation to consumers of the feminine gender or even children (Ladeira *et al.*, 2016). Moreover, not least important for the management context, negative consequences because of impulse buying were not detected.

The limitations presented in this study resume to the problems of developing a meta-analysis. First, for the scope of analysis, only the quantitative research was considered. In this sense, various qualitative articles that were found in the systematic review did not take part in the analysis. Further analysis in the study of these articles is recommended, maybe using only a systematic review as a methodological strategy for analysis. Second, a considerable part of the variance in all studies, as we can see in the funnel plot (Appendix 2), remained without explanation, as the few moderator effects were significant and also because of the impossibility of realizing the test between all of the constructs related to impulse buying. Third, some other direct relations were not tested, as they did not present more than three effect-sizes and, though, could not be used in the model. Variables that would deserve to be further analyzed emerge here: compulsive consumption, status consumption and conspicuous consumption. Fourth, the number of used works of the gray literature was not expressive enough and, though, did not allow us to evaluate the possible influence of the overestimation of the effects caused in published periodicals (Uttley and Montgomery, 2017). Future research should focus, specifically, on the gray literature, seeking to evaluate this possible moderator.

As a suggestion for future studies, we recommend the enlargement of the analysis of behaviors that were little worked in primary studies as, for example, materialist consumption, pleasure with purchase, utilitarian value, circulation time, loyalty to the company, positive and negative emotions.

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Appendix 1

Consequences
of impulse
buying

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Study	Sample	Type of sample	Type of publication	Analysis Context	Evaluated construct
Abratt and Goodey (1990)	2284	Consumers	Journal	Physical	Decision-making
Adeelar <i>et al.</i> (2003)	95	Students	Journal	Online	Impulsiveness
Amos and Spears (2010)	101	Students	Journal	Online	Involvement
Arocas <i>et al.</i> (2011)	200	Students	Journal	Online	Negative emotions, Materialism, Impulsiveness
Beatty and Ferrell (1998)	551	Students	Journal	Physical	Impulsiveness
Bratko <i>et al.</i> (2013)	339	Students	Journal	Physical	Impulsiveness, Utilitarian
Burnett (2006)	99	Students	Thesis	Online	Impulsiveness
Cardoso <i>et al.</i> (2009)	213	Students	Journal	Physical	Impulsiveness, Innovation
Chen (2013)	618	Consumers	Journal	Physical	Materialism, impulsiveness, decision-making
Chen (2008)	430	Students	Journal	Physical	Impulsiveness
Chen (2011)	414	Consumers	Journal	Online	Impulsiveness
Cole and Clow (2011)	492	Students	Journal	Physical	Impulsiveness
Correia (2011)	364	Consumers	Dissertation	Physical	Impulsiveness, Materialism, Loyalty
Costa and Laran (2003)	2634	Consumers	Journal	Physical Online	Environment, Negative and positive emotions, income
Costa and Laran (2006)	2634	Consumers	Journal	Online	Environment, income, positive and negative emotions
Cunha (2013)	131	Students	Journal	Physical	Decision-making
Davis and Sajtos (2009)	386	Consumers	Journal	Physical	Environment, Impulsiveness
Dawson and Kim (2009)	300	Consumers	Journal	Online	Impulsiveness, utilitarian, hedonic
Dawson and Kim (2010)	60	Consumers	Journal	Online	Decision-making
Dholakia (2000)	101	Students	Journal	Physical	Impulsiveness
Dittmar <i>et al.</i> (1995)	20	Students	Journal	Physical	Gender, Materialism, Decision-making
Effertz <i>et al.</i> (2014)	404	Students	Journal	Physical	Advertising attitude
Fenech (2002)	385	Students	Journal	Online	Decision-making
Fenton-O'Creivy <i>et al.</i> (2012)	109472	Consumers	Work Paper	Physical	Hedonic, Income
Fernandes and Veiga (2006)	254	Mixed	Journal	Physical Online	Circulation, Income, time, self-esteem
Flight <i>et al.</i> (2012)	352	Consumers	Journal	Online	Negative and positive emotions
Floh and Madlberger (2013)	508	Consumers	Journal	Online	Gratification, circulation
Foroughi (2011)	120	Consumers	Journal	Physical	Impulsiveness, circulation

Table AI.
Synthesis of the meta-analyzed studies
(continued)

Study	Sample	Type of sample	Type of publication	Analysis Context	Evaluated construct
Gerbing <i>et al.</i> (1987)	243	Students	Journal	Physical	Decision-making
Gutierrez (2004)	502	Consumers	Journal	Physical	Decision-making
Hanzaee and Taherikia (2010)	496	Consumers	Journal	Physical	Impulsiveness
Harmancioglu <i>et al.</i> (2009)	154	Consumers	Journal	Physical	Impulsiveness
Haws <i>et al.</i> (2012)	136	Students	Journal	Physical	Self-control
He <i>et al.</i> (2010)	1317	Consumers	Journal	Physical	Price
Herabadi (2003)	106	Students	Thesis	Physical	Impulsiveness
Herabadi <i>et al.</i> (2009)	103	Consumers	Journal	Physical	Hedonic, environment, utilitarian
Hung (2008)	153	Students	Thesis	Online	Time
Jawaid <i>et al.</i> (2013)	150	Students	Journal	Physical	Decision-making
Jeffrey and Hodge (2007)	311	Students	Journal	Online	Age
Jones (2003)	261	Consumers	Journal	Physical	Impulsiveness
Joo Park <i>et al.</i> (2006)	217	Students	Journal	Physical	Involvement, positive emotions, hedonic, Decision-making
Kacen <i>et al.</i> (2012)	706	Mixed	Journal	Physical	Culture
Kacen (2002)	706	Mixed	Journal	Physical	Culture
Kang (2009)	246	Students	Journal	Physical	Decision-making
Kwak <i>et al.</i> (2006)	202	Consumers	Journal	Physical	Decision-making
Kwek <i>et al.</i> (2010)	242	Students	Journal	Online	Decision-making
Lai (2010)	906	Students	Journal	Physical	Decision-making, gender
Lee (2013)	903	Students	Journal	Physical	Variety search, price, risk, gratification, adventure
Liang <i>et al.</i> (2008)	419	Consumers	Journal	Physical	Age, price, gender
Lin and Chuang (2005)	574	Consumers	Journal	Physical	Impulsiveness
Ling, Chai and Piew (2010)	248	Student	Journal	Online	Decision-making
Lins and Pereira (2011)	154	Students	Journal	Physical	Age
Liu <i>et al.</i> (2014)	318	Students	Journal	Online	Impulsiveness
Luna-Arocas (2008)	358	Consumers	Journal	Not informed	Gender, age, culture, income
Ma (2014)	414	Consumers	Thesis	Physical	Impulsiveness
Mai (2003)	358	Consumers	Journal	Not informed	Age
Mattila and Wirtz (2001)	343	Consumers	Journal	Physical	Environment, emotions
Mattila and Wirtz (2008)	138	Consumers	Journal	Physical	Environment
Meade (2012)	271	Students	Thesis	Physical	Self-control
Mohan <i>et al.</i> (2012)	733	Consumers	Journal	Physical	Environment
Nederkoorn (2009)	94	Students	Journal	Online	Negative and positive emotions
Niu and Wang (2009)	337	Students	Journal	Physical	Age
Omar and Kent (2001)	252	Consumers	Journal	Physical	Impulsiveness
Ozen and Engizek (2014)	430	Consumers	Journal	Online	Gratification

Table AI.

(continued)

Study	Sample	Type of sample	Type of publication	Analysis Context	Evaluated construct
Parboteeah (2005)	216	Students	Thesis	Online	Decision-making, utilitarian, hedonic
Parboteeah <i>et al.</i> (2009)	264	Students	Journal	Online	Gratification
Park <i>et al.</i> (1989)	68	Consumers	Journal	Online	Sensory, price, variety, hedonic, utilitarian
Park <i>et al.</i> (2012)	356	Students	Journal	Online	Environment, price, variety, hedonic, utilitarian
Park <i>et al.</i> (2006)	217	Students	Journal	Physical	Positive emotions
Peck and Childers (2006)	46	Consumers	Journal	Physical	Impulsiveness
Pentecost and Andrews (2010)	614	Consumers	Journal	Physical	Gender
Phau and Lo (2004)	225	Consumers	Journal	Physical	Innovation
Pirog (2007)	234	Students	Journal	Physical	Materialism, Impulsiveness
Piron (1991)	361	Consumers	Journal	Physical	Impulsiveness, emotions
Podoshen and Andrzejewski (2012)	500	Consumers	Journal	Not informed	Conspicuous, Loyalty, Materialism
Rajagopal (2008)	270	Consumers	Journal	Physical	Decision-making, Compulsiveness, Loyalty
Roberts and Manolis (2012)	403	Consumers	Journal	Physical	Self-control
Rook and Fisher (1995)	104	Consumers	Journal	Physical	Impulsiveness
San-Martin and López-Catalán (2013)	447	Consumers	Journal	Online	Innovation
Santini (2008)	310	Students	Dissertation	Online	Decision-making
Santini and Espartel (2010)	310	Students	Journal	Online	Decision-making
Sharma <i>et al.</i> (2010)	321	Students	Journal	Physical	Impulsiveness, self-control
Sloot <i>et al.</i> (2005)	749	Consumers	Journal	Physical	Age
Sultan <i>et al.</i> (2012)	178	Students	Journal	Physical	Age
Sun and Wu (2011)	381	Students	Journal	Online	Gratification, Materialism
Tifferet and Herstein (2012)	257	Students	Journal	Physical	Age, income
Tuyet (2003)	358	Consumers	Journal	Not informed	Culture, Impulsiveness, environment, income, age, gender
Van Kenhove <i>et al.</i> (2003)	301	Consumers	Journal	Physical	Idade
Verhagen and Van Dolen (2011)	532	Consumers	Journal	Online	Negative and positive emotions, circulation, Impulsiveness, gratification

(continued)

Table AI.

Study	Sample	Type of sample	Type of publication	Analysis Context	Evaluated construct
Verplanken and Herabi (2001)	106	Students	Journal	Physical	Gender, age, Decision-making
Vohs and Faber (2007)	66	Students	Journal	Physical	Impulsiveness
Wells <i>et al.</i> (2011)	223	Students	Journal	Online	Impulsiveness
Wood (1998)	529	Consumers	Journal	Physical	Age
Yang <i>et al.</i> (2008)	337	Students	Journal	Physical	Age
Yi (2013)	445	Consumers	Journal	Physical	Materialism
Zhang and Shrum (2009)	128	Students	Journal	Physical	Decision-making
Zhou and Wong (2004)	225	Consumers	Journal	Physical	Atmosphere, emotions, gender, age, income

Table A1.

Appendix 2

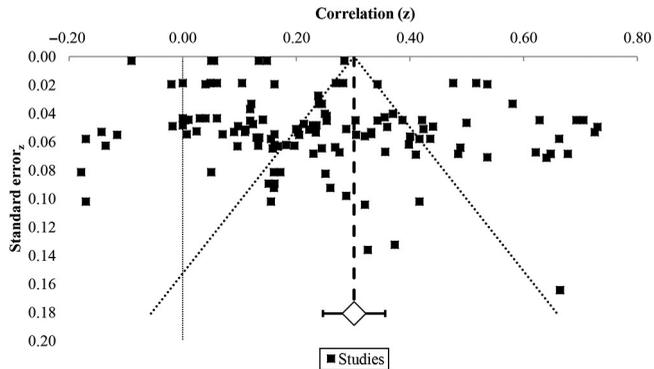


Figure A1.
Funnel plot impulse buying

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