



Marketing

Understanding consumer's responses to negative emotions related to crowding on satisfaction and impulse purchase in retail: the mediating role of coping

*Entendendo respostas às emoções negativas de crowding na satisfação e compra por impulso no varejo: o papel mediador do Coping*

*Respuestas a las emociones negativas de crowding en la satisfacción y compra por impulso en el comercio minorista: el papel mediador del coping*

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**Abstract**

The perception of crowding, understood as an individual's response to crowds, can be observed in retail environments and influences positive and negative emotions. In this research we test the mediating effect of coping – rational strategies adopted to deal with negative emotions – in the relationship between negative emotions (resulting from crowding perception) and consumer behavior (measured by impulse purchase and satisfaction). The findings related to coping explain to what extent there is a positive response to human density in the retail environment. For this, a theoretical model was developed which includes the relationships among perception of crowding, positive and negative emotions, and consumer behavior. The model enhances the understanding of the crowding phenomenon by including relationships mediated by an oppositional strategy (coping dimension) between negative emotions and consumer behaviors. To test the theoretical model, a survey was conducted with 456 respondents and hypothesis tests using structural equation modeling. It was evidenced that crowding perception has more robust effects on negative emotions than positive emotions. It is emphasized that with the inclusion of opposition mediation, the weak direct relationship between negative emotions and behaviors, becomes a positive relationship between negative emotion and impulse purchase, and negative emotion and satisfaction. In addition to the theoretical contributions of the tested model, future research and managerial implications are proposed at the end of the article. © 2017 Departamento de Administração, Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo – FEA/USP. Published by Elsevier Editora Ltda. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

**Keywords:** Crowding and coping perception; Positive and negative emotion; Impulse purchase and satisfaction; Consumer behavior; Human density in retail

**Resumo**

A percepção de *crowding*, entendida como a resposta individual à aglomeração pode ser observada em um ambiente de varejo e influenciar as emoções positivas e negativas. Nesta pesquisa propõe-se testar o efeito mediador do *coping* - estratégias racionais adotadas para lidar com emoções negativas - na relação entre emoções negativas, consequentes da percepção de *crowding*, e comportamento de consumidores (mensurados por compra por impulso e satisfação). Os achados referentes ao efeito de *coping* contribuem para explicar em que medida há resposta positiva à

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densidade humana em ambiente de varejo. Para isso, foi desenvolvido um modelo teórico com a relação da percepção de *crowding*, emoções positivas e negativas e comportamento do consumidor. O modelo incrementa o entendimento do fenômeno de *crowding* quando inclui relações mediadas pela oposição (dimensão de *coping*) entre emoção negativa e comportamento do consumidor. Para testar o modelo teórico foi realizado um *survey* com 456 respondentes e os testes de hipótese com a utilização de modelagem de equações estruturais. Foi evidenciado que percepção de *crowding* tem efeitos mais robustos nas emoções negativas que nas emoções positivas. Destaca-se que com a inclusão da mediação de oposição, a relação fraca entre a emoção negativa e comportamentos, na relação direta torna-se positiva entre emoção negativa e compra por impulso, e emoção negativa e satisfação. Além das contribuições teóricas do modelo testado, futuras pesquisas e implicações gerenciais são propostas no final do artigo.

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*Palavras-chave:* Percepção de *crowding* e *coping*; Emoção positiva e negativa; Compra por impulso e satisfação; Comportamento do consumidor; Densidade humana no varejo

## Resumen

La percepción de hacinamiento, entendida como la respuesta individual a la aglomeración puede ser observada en un entorno de comercio minorista e influir en las emociones positivas y negativas. En este estudio se analiza el efecto mediador del afrontamiento – estrategias racionales adoptadas para hacer frente a las emociones negativas – en la relación entre las emociones negativas, oriundas de la percepción de *crowding*, y el comportamiento de consumidores (medidos por la compra por impulso y satisfacción). Los hallazgos sobre el efecto de *coping* contribuyen para explicar en qué medida existe una respuesta positiva a la densidad humana en el ambiente de venta al por menor. Se ha desarrollado un modelo teórico con enfoque en la relación de la percepción de *crowding*, emociones positivas y negativas y comportamiento del consumidor. El modelo incrementa la comprensión del fenómeno de *crowding* al incluir relaciones mediadas por la oposición (dimensión de *coping*) entre emoción negativa y comportamiento del consumidor. Para probar el modelo teórico y la hipótesis, se ha llevado a cabo un *survey* con 456 encuestados y se han aplicado los modelos de ecuaciones estructurales. Se ha demostrado que la percepción de *crowding* tiene efectos más sólidos sobre las emociones negativas que en las emociones positivas. Es de destacar que, con la inclusión de la mediación de oposición, la relación débil entre la emoción negativa y el comportamiento, en la relación directa, se convierte en positiva entre emoción negativa y la compra por impulso, y emoción negativa y satisfacción. Además de las contribuciones teóricas del modelo puesto a prueba, se proponen al final del artículo sugerencias para futuras investigaciones e implicaciones de gestión.

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*Palabras clave:* Percepción de *crowding* y *coping*; Emoción positiva y negativa; Compra por impulso y satisfacción; Comportamiento del consumidor; Densidad humana en el comercio al por menor

## Introduction

One of the first published works on the purchase and social relation environment was that of Jonassen (1959). Since then, the quantity and composition of human or social density has been treated as one of the store environmental factors. Turley and Milliman (2000) classified the crowding of people at the point of sale as a factor that contributes to the store environment, and specifically as one of the human factors. This research focuses on the crowding of consumers and the consequences in the store environment, since, according to Eroglu, Machleit, and Barr (2005), human density influences the perception of other factors of the store environment, such as layout and ambience.

According to McClelland and Auslander (1978), the determinants of crowding can be physical, informative, and even social, such as type of activity and whether the large number of people are “jostling” in the retail environment. The perception of crowding can be observed or not, under crowded conditions. When crowding is perceived, discomfort may occur in the environment, which can be triggered by personal, situational, and cultural variables (Mehta, 2013; Quezado, Costa, Peñalosa, Matos, & Ferraz, 2015). What can be perceived as crowding for some people may be normal for others, i.e., just a group of people.

Harrell, Hunt, and Anderson (1980) argue that the perception of crowding can be influenced by personality traits such as impatience and aggressiveness. For the authors, the consumer who does not have prior experience within a crowded environment may be more sensitive to density and thus react negatively. Similarly, buyers with personality traits such as impatience and aggressiveness may also be more susceptible to human density. In this research, we address the negative effect of human density, which will be treated as perception of crowding.

Just as some personality traits may exacerbate the perception of crowding, tolerance to it has been presented as a trait that minimizes the negative effect. Pan and Siemens (2011) state that crowding tolerance is significantly correlated with the intention to explore the store. In the study by Machleit, Eroglu, and Mantel (2000), crowding tolerance was treated as moderating the relationship between crowding perception and satisfaction with purchase, reducing the negative effect of crowding perception on satisfaction (Baker & Wakefield, 2012).

Baterson and Hui (1982) argue that the perception of crowding can influence emotion, causing consumer exhaustion. The perception of crowding may be accompanied by symptomatic behaviors of stress similar to a reaction of personal injury or threat that appears in unfavorable relationships between the person and the environment (Lazarus, 1993). Such reactions

may manifest with discomfort, aggression, and motivation to eliminate the causes of discomfort or reduce their importance (Stokols, 1972). The negative reaction to the perception of crowding can result in coping and impulse purchase (Graa & Dani-Elkebir, 2012). Negative emotions, according to Lazarus (1993), can lead to stress and, consequently, coping, as a cognitive strategy to deal with stress (Duhachek & Oakley, 2007; Yi & Baumgartner, 2004). The tendency to impulse buy can be observed in the behavior of the consumers at the time of purchase, when buying products that they did not intend to buy, due to many reasons, including environmental stimuli such as crowding (Beatty & Ferrell, 1998).

The retail environment and the perception of crowding have been the subject of academic research, but, as highlighted, few studies have addressed consumer responses under negative emotions. Baker, Levy, and Grewal (1992) analyzed behavior resulting from emotions, the relationship between the buying environment and buying orientation, examining whether the purchase is a task or a social endeavor, as well as the need for stress control. For Baker et al. (1992), the greater the perception of crowding, the greater the stress. But no work has analyzed the results of the perception of crowding and its influence on emotions and coping, which is the object of the current study. It is believed that when experiencing emotions, the consumer seeks to adapt to the environment, and may employ an opposition strategy, one coping dimension (Lazarus, 1993), which results in different behavioral responses, such as impulse purchase. In Brazil, some research has been carried out on the crowding phenomenon (Aguilar, Farias, Gomes, & Santos, 2015; Aureliano et al., 2015; Brandão, Parente, & Oliveira, 2010; Ferreira, Bizarrias, Silva, & Brandão, 2015; Quezado, Costa, & Fuentes, 2014; Quezado, Costa, Peñaloza, & Barboza, 2012), but, again, none analyzed the results of crowding perception and its influence on emotions and coping.

Cognitive responses, such as strategies to minimize the negative emotional effect of perceived crowding, may explain behavioral reactions and contribute to a more positive consumer shopping experience. However, even with the importance of coping strategies, we found no studies that tested the effect of coping on the relationship between perception of crowding, satisfaction, and impulse purchase. Even in emerging markets with a high population density, as in metropolitan areas of Brazil, there are still few studies that seek to understand what explains positive responses (more satisfaction and increases in impulse purchase). Sheth (2011) suggests that the phenomena studied in developed markets may not have the same relationships between the variables that make up the phenomenon in emerging markets, which reinforces the relevance of this study.

Therefore, the questions under investigation for this work are as follows. What are the behaviors of consumers (impulse purchase, satisfaction) under negative and positive emotions, in environments with high human density? How can coping change the influence of negative emotions from human density?

The objective of this work is to test the effect of crowding perception and negative emotion, when mediated by coping, on impulse purchase and satisfaction in a retail environment. To reach this goal, we needed to identify the degree of perception of

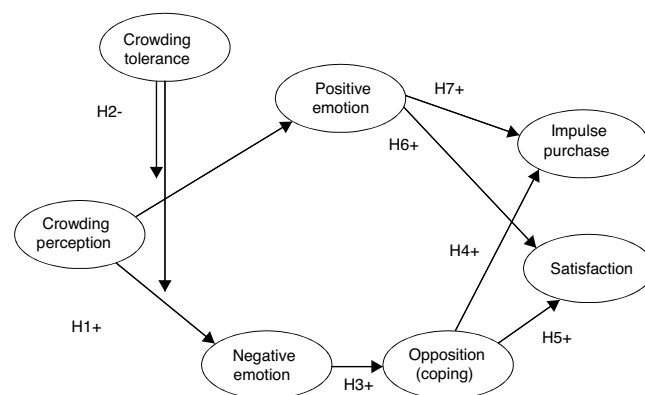


Fig. 1. Theoretical model.

crowding by consumers; measure negative emotional responses to crowding perception; test behavioral responses under negative emotions mediated by coping; and test behavioral responses under the positive emotions that influence impulse purchase and satisfaction.

The empirical findings of this study will contribute to the management of the retail environment, presenting the mechanisms that explain different reactions of the consumers to the crowding in stores. Even if part of the response is influenced by the consumer profile, issues related to the emotions felt by the consumer and their rational responses can be influenced by stimuli and strategies.

### Theoretical reference and hypothesis development

This work was developed based on the theoretical review of analysis of human density, perception of crowding, tolerance to crowding, negative and positive emotions, impulse purchase, satisfaction, and coping. In this research, an opposition strategy was used as a proxy for coping – and represents the effort to project causes of stress to others, assuming an aggressive posture that can occur with the perception of crowding in the retail environment (Duhachek & Oakley, 2007).

Thus, we have the perception of crowding as an independent variable, which can directly influence the affective responses (negative and positive emotions), and lead to coping and the behaviors analyzed as our dependent variables: impulse purchase and satisfaction. Crowding tolerance was used as a moderating variable in the relationship between crowding perception and emotion. The relationship between negative emotions, positive emotions, and impulse purchase and satisfaction were tested as relationships mediated by coping, according to the theoretical model (Fig. 1).

#### Density and perception of crowding

Stokols (1972) argued that although density is a physical state involving spatial limitation, it also encompasses informational factors such as order and outputs, and social factors, such as the type of site activity (McClelland & Auslander, 1978). Agglomeration, understood as the perception of crowding, is an experience

or state that refers to the nature of the space constraint perceived by the individual.

There are two types of density: social or human density and space density (McGrew, 1970; Stokols, 1972). Social density refers to the actual number of people in a given space and spatial density, to the amount of space occupied per person. The spatial density experience is related to the physical state of movement restriction, which may be caused by the number of people in the environment, amount of space, and interpersonal distance. Studies on the subject agree that human density and spatial density are the two main antecedents of the perception of crowding.

Machleit, Kellaris, and Eroglu (1994), through laboratory experiments, identified two dimensions of agglomeration, perceived in the retail environment: a two-dimensional approach and the human and spatial dimensions. However, the literature on environmental psychology suggests two types of density: spatial and social (McGrew, 1970), and the topic is discussed in several studies (Eroglu et al., 2005; Harrell et al., 1980; Hui & Bateson, 1991; Machleit et al., 2000; Pan & Siemens, 2011). In a bibliographical review, Mehta (2013) treats human and social density dimensions as synonymous.

The definition of crowding perception according to Mehta (2013) becomes complex as the same density or perception of density levels may or may not result in discomfort for different customers. For some, the environment may be full and for others it may not. This is due to a number of factors, including personal (Machleit et al., 2000), situational (Eroglu, Harrell, & Machleit, 1990; Machleit et al., 2000), and cultural variables (Pons & Laroche, 2007; Mehta, 2013; Pons, Laroche, and Murali, 2006). Consumers who do not have prior experience in a crowded environment may be sensitive to agglomeration (Harrell et al., 1980). Similarly, buyers with personality traits such as impatience and aggressiveness may be more susceptible to perceived crowding.

The perception of crowding may influence emotions (Bateson & Hui, 1982), may have different effects on different people (Freedman, Levy, Buchaman, & Price, 1972), and may be accompanied by symptomatic behaviors, such as stress (Stokols, 1972), caused by discomfort. There may also be aggression and a motivation to eliminate the cause or reduce its importance as an emotional response influenced by personality traits such as impatience and aggressiveness (Harrell et al., 1980). There is still the possibility of a positive reaction, such as pleasure; or a negative reaction, such as displeasure (Baker & Wakefield, 2012; Freedman et al., 1972; Lazarus, 1993; Mehta, Sharma, & Swanmi, 2013) in response to a situation in the retail environment in relation to a circumstance. The response may be a cognitive element of physical and social interaction (Keating, 1976).

The topics of crowding perception and its influence on emotion and observed outcome have been controversial among researchers. Baker and Wakefield (2012) studied the behavior caused by emotions, the relationship between the purchase environment and the purchase orientation, whether the purchase is a task or social purchase, the need for stress control, and the positive emotions experienced by the consumer. For the authors, the greater the perception of crowding, the greater the stress.

### *Crowding tolerance*

Crowding tolerance may moderate the relationship between crowding perception and satisfaction with purchase (Machleit et al., 2000). The purchase satisfaction of customers with high perception of crowding but with high tolerance to crowding will not be affected. Also, crowding perception will not affect most customers in discount stores.

In crowding perception research, the crowding tolerance variable was identified as intervening between the perception of crowding and the satisfaction with the purchase and is significantly correlated with the intention to explore the store (Pan & Siemens, 2011). Crowding tolerance was treated as moderating the relationship between crowding perception and satisfaction with purchase, reducing the negative effect of crowding perception on satisfaction (Machleit et al., 2000). Crowding tolerance has also been treated as a mediator in other studies (Baker & Wakefield, 2012). In this research, crowding tolerance will be tested as a moderating variable in the relationship between crowding perception and negative and positive emotions.

### *Relationship between perception of crowding and emotional response*

Dion (2004) evidenced the relationship between crowding perception, coping, and personal control in a hypermarket research study with Thompson's (1981) personal control and stress scales. The crowding and coping scales of perception were developed by Dion (1999, as cited in Dion, 2004). Eroglu et al. (2005) analyzed the perception of human and social crowding that takes into account emotion, analyzing six types: joy, interest, surprise, contempt, disgust and anger. These authors used the S-O-R (stimulus-organism-response) model as the theoretical paradigm from Mehrabian and Russell (1974, as cited in Soriano & Foxal, 2001)

Emotions can generate satisfaction in the purchase and one can observe impulsive purchases, time, and purchases by the aisle (Li, Kim, & Lee, 2009). In another study, Jones, Vilches-Montero, Spence, Eroglu, and Machleit (2010) evidenced a relationship between different emotions caused by the perception of crowding and satisfaction. Emotions were divided into groups that had a negative effect on the hedonic purchase: Emotion 1 (frustrated, angry, irritated, feeling disgusting, unfulfilled, unhappy and disgusted) and Emotion 2 (provocative, contemptuous and disrespectful). Emotion 1 set was the only one that had a direct influence on satisfaction with the purchase.

None of these results are derived from analysis of the same emotion. When the same emotion is searched, the results obtained are divergent. Baker et al. (1992) investigated the influence of stress. Although stress has a positive effect on the perception of crowding, it also has a positive effect on excitation. In the research by Li et al. (2009), pleasure is the most significant positive emotion to achieve satisfaction with the purchase.

Other studies that measured different positive and negative emotions, which identified the crowding perception as antecedent, also demonstrate the lack of consistency between

the effects of emotions. For Eroglu et al. (2005), anger and heartbreak were the emotions that were most influenced by the perception of crowding. For Dion (2004), discomfort and being in a hurry were the most influential, unlike that found in Baker and Wakefield's (2012) research, which points to stress as the emotion that receives the most influence of human density. Thus it remains important to analyze the influence of crowding over emotions. Baker and Wakefield (2012) study positive emotions as results of the perception of human agglomeration. The emotions that best predict negative responses, as pointed out by Dion (2004) were aggression and flight.

Based on the crowding theory discussed so far about the relationship between crowding perception, positive emotions, negative emotions, and crowding tolerance, it is possible to propose the following hypotheses already represented in Fig. 1.

**H1.** Increased perception of human crowding increases negative emotions, but the effect is mitigated by crowding tolerance (crowding tolerance moderating effect).

**H2.** The increased perception of human crowding increases negative emotions, but this relationship is moderated by crowding tolerance, which reduces this impact.

That is, the moderating effect of crowding tolerance causes a direct and negative effect of crowding perception on another variable to be weakened, as far as this indirect effect is observed.

The models presented on the phenomenon of crowding perception exerting an influence on emotions (Dion, 2004; Eroglu et al., 2005; Jones et al., 2010; Li et al., 2009) did not test the relationship between crowding perception and coping-mediated emotions. Coping is expected to be a mechanism that helps explain the positive responses to crowding perception, even when the experienced emotions are negative.

#### *Emotions, coping, and consumer responses (satisfaction and impulse purchase)*

Luce, Bettman, and Payne (2001), conducted one of the best studies that discusses coping strategies as a tool to deal with negative emotions, since crowding perception is a negative emotional response to high human density. In this study, we expected that consumers would present specific coping strategies to fit the particular context of the buying experience.

Studies on coping vary in the construction of their dimensional structures (Skinner, Sherwood, Edge, & Altman, 2003). Coping research has been developed as either emotion-oriented or problem-oriented, as well as with respect to withdrawal or approximation. These orientations configure the two most important paradigms in this area of study (Duhachek & Oakley, 2007). In addition to these two paradigms, coping has also been treated theoretically through more complementary dimensions, such as assimilation, control, and others (Duhachek & Oakley, 2007; Skinner et al., 2003).

The studies of Skinner et al. (2003), Duhachek (2005) and Duhachek and Oakley (2007) consider theories that explain situational coping by aggregate dimensions seeking parsimony, such as focus on emotions versus problems (Lazarus & Folkman,

1984), or withdrawal versus approximation (Roth & Cohen, 1986; Krohne, 1993), which are not stable under different conditions and stress situations. In this body of research, more than one theory is aggregated in order to understand the oppositional dimension, pointed out as an effort to project the causes of stress on others and adopt an aggressive stance (Duhachek & Oakley, 2007). In this work, the opposition dimension is tested, that is, the effort to project causes of stress in others, assuming an aggressive stance (Duhachek & Oakley, 2007).

The theoretical advance of this research comes from the investigation of which dimensions, among those considered more constant in previous studies, can measure the strategies of the opposition phenomenon with increased perception of crowding. This research is based on studies by Skinner et al. (2003), Duhachek (2005) and Duhachek and Oakley (2007). Based on the SOR Paradigm, it is possible to relate the opposition dimension of coping as a rational response, which seeks to balance negative responses of consumers. In this way, the buying behavior would occur after this attempt for internal balance within the individual. As a result, the consumer would have a more positive buying experience, even in high human density condition. The opposition mediation hypothesis is justified because it is an internal control mechanism of the individual and can be described as follows.

**H3.** Increasing negative emotion increases opposition.

The stimuli created by the selling environment, such as selling techniques, used by stores (Stern, 1962; Kaltcheva & Weitz, 2006), help promote impulse purchase and can help clients to buy products they did not intend to buy (Applebaum, 1951), mainly guided by external memories. Many authors point out that consumers are more prone to new experiences and impulse shopping in supermarkets or malls (Rook & Fisher, 1995).

The perception of crowding can generate negative emotions in the consumers, and by regulating actions, consumers can adjust this emotion, and generate positive emotions (Tice, Bratslavsky, & Baumeister, 2001). In this research, coping functions as a negative emotion regulator making the tendency for fewer impulse purchases and less satisfaction to be reversed, generating, from the opposition strategy, more impulse purchases and greater satisfaction. That way, coping becomes a mediating variable and functions as a mechanism that regulates the negative response to the perception of crowding.

In the surveys of Donovan and Rossiter (1982) and Mattila and Wirtz (2008), the perception of crowding increases activation and increases impulse purchases. In the works by Li et al. (2009) and Pan and Siemens (2011), the perception of crowding is related to positive emotions. It is believed that, when experiencing negative emotions, the consumer seeks to adapt to the environment, and may employ an oppositional strategy, one coping dimensions (Lazarus, 1993), which results in different behavioral responses, such as impulse purchase. In this situation, coping regulation may make the response more rational, but at the same time lead the consumer to impulsive behavior as long as he/she remains uncomfortable with human density. Therefore, the consumer looks to quickly resolve the purchase task. This behavior may be characterized as impulse purchase.

In this way, both positive emotions and negative emotions may create greater impulse purchases and greater satisfaction responses. For this to occur, in the case of negative emotions, regulation is required through the coping mechanism.

**H4.** The increase of negative emotion increases impulse purchase when mediated by the oppositional strategy.

**H5.** An increase in negative emotion increases oppositional behavior and satisfaction with purchases made when mediated by the oppositional strategy.

**H6.** Increasing positive emotions increases satisfaction with purchases.

**H7.** Increasing positive emotions increases impulse purchase.

The following is the method for testing the hypotheses that were developed.

## Method

### *Scale validation and construction of the data collection instrument*

The data collection instrument was developed taking into account the variables necessary to respond to the objectives proposed in this study. The items of negative emotion variables and purchase intention were taken from articles in English and were culturally adapted to Portuguese. Following the process of [Beaton and Guillemin \(2000\)](#), the English scales went through several phases for cultural adaptation and validation.

The first phase was the translation into the Portuguese language, with the translation being performed by two renowned professionals. A consensus version was then produced by a third-language English professional. The next step was the reverse translation of the scale, with the help of two more language professionals, which gave rise to another consensus version. In the validation by experts, the probing technique was used to validate the contents of the instrument for the pre-test, with the cultural adaptation of the items.

The emotional affective responses employed in this work have scales of measures to identify the responses of negative emotions (NE), taken from the article by [Baker and Wakefield \(2012\)](#). An expression was used in the opening of the question: “In this shop environment I feel,” before the presentation of the items “Frantic”, “Tense”, “Agitated”, “Terrified”, and “Hurried.” To complete the NE variable, the dimensions of anger and discontent were taken from the work of [Richins \(1997\)](#). An expression was included in the opening of the question: “In this shop environment I feel”, before the items “Frustrated”, “Angry”, “Irritated”, “Not fulfilled”, and “Displeased”.

The affirmations for positive emotions (PE) were taken from the works of [Donovan and Rossiter \(1982\)](#); [Li et al. \(2009\)](#); [Mehrabian and Russell \(1974, as cited in Soriano & Foxal, 2001\)](#) and [Mehta \(2013\)](#): “Happy – Unhappy”; “Grateful – Unpleasant (spoiled)”, “Satisfied – Unsatisfied”; “Confident – Discouraged”; “Relaxed – Tired (bored)”; “Relaxed – Bored (melancholic)”; “Content – Depressed”; “Important – Negligi-

ble”; and “Free – Restricted”. The assertions about crowding perception employed in this work were taken from the work by [Machleit et al. \(1994\)](#), “The store seems very crowded,” “There is a lot of movement in this store,” and “There are a lot of customers in this store”. For crowding tolerance we used items from [Jones et al. \(2010\)](#) including, “I would be satisfied with my shopping experience at this store”, “Having a choice, I would probably go back to that store”, and “I choose this store because I like to come to shop regularly here.”

The items to test the purchase intention were taken from the works by [Lopes et al. \(2012\)](#). These included: “I would go to this store to make purchases in the future”, “I would go to this store frequently”, and “I would increase the value of my purchases in this store, in addition to what I spend on average.” Additional items were taken from [Vieira and Mattos \(2012\)](#), including “Your intention to purchase the product is: 1 – very low/7 – very high”, and “The probability of buying the advertised product is: 1 – none/7 – high”.

Measurements for impulse purchases were taken from the work by [Rook and Fisher \(1995\)](#), and thus adapted: “I would buy things spontaneously in this situation”, “‘Buy soon’ describes how I would buy in this situation”, “In this type of situation, I would buy things without thinking about it”, “‘I saw and bought’ would describe me in this situation”, “‘Buy now, think later’ would describe me in this situation”, “I would buy things in the heat of the moment, in this kind of situation”, “I would buy things according to what I was feeling at the moment”, “I would carefully plan my purchases in this kind of situation”, and “I would be a little reckless with my purchases in this kind of situation.”

For opposition-coping measurement, items were taken from the work by [Duhachek and Oakley \(2007\)](#). These items include, “In this kind of situation I would affirm that the fault (responsibility) of what happens is of the others”, “In this type of situation I would be aggressive”, and, “In this type of situation, I would blame others for the problem.” The items to test satisfaction were taken from the work of [Brandão \(2012\)](#): “I would feel pleasure to shop at this store”; “I’d be happy with my shopping experience at this store”; “Having a choice, I probably would not go back to that store”; and “I would recommend this store to other people.”

The constructs of perception of crowding and satisfaction had the cultural adaptation performed by [Brandão \(2012\)](#). The items of the variables of negative emotion, tendency to impulse buy, control of the purchase, and intimacy with the purchase were taken from articles in English and adapted culturally to Portuguese. Following the [Beaton and Guillemin process \(2000\)](#), the English scales underwent several phases of cultural adaptation and validation.

### *Strategy for data collection*

To obtain the data, the respondents were exposed to a visual stimulus, [Fig. 2](#), which presents a high human density purchase situation. It is justified to use this stimulus to anchor all the respondents in the same condition of human density, and to emphasize the condition of high human density to amplify the



Fig. 2. Stimulus with high human density.

variation of individual emotional responses and of the respondents' perception.

Baterson and Hui (1982) demonstrated that there is ecological validity in the use of photographs and films to test the crowding theory.

After viewing the photo, the respondents answered the questionnaire with the measurement of the model variables and profile data of the respondents.

#### Criteria for analyzing the data

Data analysis showed normality, homoscedasticity (describe what it is) and absence of multicollinearity (Variance Inflation Factor, or  $VIF > 5$ ) with SPSS 20.0 software, and nomological validity by means of Structural Equations Modeling (SEM). For the SEM, the software SmartPLS2.0M3 was used, which is suitable for estimation using partial least squares, non-parametric samples, and small size samples (Ringle, Silva, & Bido, 2014; Ringle, Wende, & Will, 2005).

As a parameter of analysis, the SEM should verify convergent validity ( $\lambda$  above 0.7) and mean extracted variance (AVE) greater than 0.5. Discriminant validity analysis is also recommended through the analysis of the comparison of the square root of the AVE of the construct versus its correlation with the other latent variables of the model. The general adequacy index of the model through Goodness of Fit (GoF) was observed, obtained by the geometric mean between the mean  $R^2$  and the mean AVE. Hair, Hult, Ringle, and Sarstedt (2014) suggest that a minimum GFR of 0.36 is adequate in the social sciences. Then the bootstrapping tests were performed to analyze the path coefficients with critical values of the Student  $t$ -test, being 1.64 for  $p < 0.1$ , 1.96 for  $p < 0.05$ , 2.57 for  $p < 0.01$ , or below 1.64 as non-significant (ns). Finally, blindfolding was observed to obtain the accuracy of the proposed model (Stone-Geisser Indicator, or  $Q^2$ ) in which for  $Q^2 > 0$  the model has predictive relevance, and for  $Q^2$  approximately zero, or less than zero, there is no predictive relevance, and we estimated the Cohen (or  $f^2$ ) indicator that evaluates how much the construct is useful for constructing the model (values of 0.012 have little utility, 0.15 average utility and 0.35 great utility) (Hair et al., 2014).

## Analysis of results

The variables did not follow a normal univariate distribution (a significant Kolmogorov–Smirnov test at the 5% level), confirming the need to use the partial least squares technique. No multicollinearities were observed (all FIVs below 5).

Firstly, it was observed that the respondents were in an ideal condition to measure the perception of crowding elicited by the stimulus presented in Fig. 1. This result can be observed in Table 1.

During the process of analysis of the nomological validity to fit the final structural model by obtaining convergent and discriminant validities, several items of the scales were withdrawn because they presented a low load (less than 0.7) or a non-significant structural relationship ( $p$ -value  $> 0.05$ ). Only one item was removed from the impulse purchase, negative emotion, positive emotion, and satisfaction dimensions.

The valid sample of this study is 457 residents of a city on the coast of São Paulo, with a mean age of 24.7 years ( $SD = 5.39$ ), of which 323 (70.8%) are women and 134 (29.2%) are men.

A non-probabilistic sample survey was conducted, characterizing a quantitative and descriptive study with cross-sectional data. In this section, we present the study variables, the field procedures, and the criteria for analyzing the results.

All AVEs were higher than 0.5, and the coefficient of determination of the model ( $R^2$ ) for the dependent variable Satisfaction was 34.4% and for impulsive purchase 33.7%. The other adjustment indicators of the model can be observed in Table 2.

The Average Extracted Variance (AVE) indicates the degree to which the items that measure the variable converge with each other and share variance to explain it, indicating the convergent validity of the model. If the AVE is higher than 0.5, it is observed that more than 50% of the variable measured was explained by the variance of the items. The greater the load of the items, the more they have in common to measure the construct

Table 1  
Perception of crowding.

Items <sup>a</sup>	Mean	Median	Standard deviation
1. The store seems to me too crowded; 2. There is a lot of traffic in this store; 3. There are a lot of customers in this store	5.581	6.00	1.471

<sup>a</sup> 7 points Likert, 1 – totally disagree to 7 – totally agree.

Table 2  
Construct, AVEs, Cronbach's alpha,  $R^2$ , composite reliability.

Construct	AVE	Composite reliability	$R^2$	Cronbach's alpha
Impulse purchase	0.642	0.900	0.317	0.860
Negative emotion	0.604	0.858	0.145	0.783
Positive emotion	0.712	0.945	0.230	0.933
Opposition coping	0.683	0.866	0.036	0.774
Crowding perception	0.716	0.883	0.000	0.806
Satisfaction	0.793	0.920	0.378	0.870
Crowding tolerance	0.572	0.800	0.000	0.622

$AVE_{\text{mean}} = 0.676$ ,  $R^2_{\text{mean}} = 0.158$ ,  $GoF = 0.417$ .

Table 3  
Analysis of the structural paths of the model.

Hypothesis	Relationship	Original coefficient	Mean of 500 sub-samples	Standard error	Test <i>t</i>	<i>p</i> -Value	Result
H1+	Crowding perception → Negative emotion	0.141	0.148	0.046	3.059	0.002	Supported
	Crowding perception * Crowding tolerance → Negative emotion	−0.139	−0.160	0.065	2.135	0.033	
H2−	Crowding perception → Positive Emotion	−0.099	−0.102	0.043	2.312	0.021	Supported
	Crowding perception* crowding tolerance → Positive emotion	0.081	0.104	0.058	1.407	0.160	
H3+	Negative emotion → Opposition_coping	0.190	0.195	0.053	3.602	0.000	Supported
H4+	Negative emotion → Impulse purchase	0.038	0.036	0.049	0.782	0.435	Supported
	Opposition_coping → Impulse purchase	0.446	0.449	0.043	10.408	0.001	
	Mediation: EN → CO → CI	–	–	–	Sobel = 3.406	0.001	
H5+	Negative emotion → Satisfaction	−0.046	−0.048	0.045	1.031	0.303	Supported
	Opposition_coping → Satisfaction	0.200	0.201	0.043	4.698	0.001	
	Mediation: EN → CO → Sat	–	–	–	Sobel = 2.859	0.004	
H6+	Positive emotion → Satisfaction	0.579	0.577	0.037	15.496	0.001	Supported
H7+	Positive emotion → impulse purchase	0.390	0.386	0.043	8.999	0.001	Supported

(Hair et al., 2014). The other indicators complete the fit of the model, either by reliability or internal validity (Cronbach's composite reliability and alpha), or by the proportion of how much the explanation of the endogenous variables was performed ( $R^2$ ) in the model, even when weighted with the AVE to observe a general index of goodness of fit (GoF).

The analysis of the structural relationships between the dimensions of the coping scale and the dependent variable Satisfaction was carried out with the re-sampling technique, bootstrap, with 500 repetitions to evaluate the significance of the loads of the structural paths. The result of this step is shown in Table 3.

Table 3 indicates that all the established hypotheses were supported after the analysis of the proposed relationships, as well as the suggested moderation and mediation. The test of the hypotheses is given by the analysis of significance of the path coefficient ( $\beta$ ), based on Student *t* tests for these coefficients. In this study 500 re-samplings were performed for the whole model. Values of *t* greater than or equal to 1.96 (*p*-value less than or equal to 5%) were observed for all hypotheses.

Table 4 presents the indicators of predictive relevance ( $Q^2$ ) and usefulness of the construct ( $f^2$ ) in the construction of the proposed model. The blindfolding test points to the predictive ability of the tested model. Indicators of  $Q^2$ , above zero, have

Table 4  
Predictive relevance and effect size.

Variable	$Q^2$	$f^2$
Purchase impulse	0.175	–
Satisfaction	0.260	–
Positive emotion	0.125	0.566
Negative emotion	0.066	0.288
Opposition	0.019	0.358
Crowding perception	–	0.424
Crowding tolerance	–	0.167

predictive validity and indicators of  $f^2$  signal the usefulness of the construct in the formation of the model. Otherwise, omission of the construct would result in a significant change in the coefficient of determination of the model ( $R^2$ ). The critical values are 0.012 (low utility), 0.15 (utility mean) and 0.35 (utility) (Hair et al., 2014).

The test of relevance or predictive accuracy ( $Q^2$ ) allows us to evaluate the degree to which the proposed model behaves as expected in the endogenous variables. Otherwise, it evaluates the predictive capacity of the model. The reference would then be the value 1, for a perfect and error-free model. Positive values already indicate good adjustment. At the same time, we evaluated the effect size ( $f^2$ ) of each exogenous variable. The



test consists of removing the variable from the model, one at a time, and evaluating the effect of its absence, or its utility, on the adjustment of the model. In the analysis, it can be seen that positive emotion ( $f^2 = 0.566$ ), followed by perception of crowding ( $f^2 = 0.424$ ) and opposition (coping dimension) ( $f^2 = 0.358$ ) are the most useful dimensions in the model. In the case of the predictive relation, satisfaction ( $Q^2 = 0.260$ ), followed by impulse purchase ( $Q^2 = 0.175$ ), are the variables best explained in the model.

The model presents predictive validity and good utility of the constructs observed in the construction of the proposed theoretical model.

### Discussion of results

In this study we tested the behavior of consumers (impulse purchase, satisfaction, and opposition – coping dimension) under negative and positive emotions, in retail environments with high human density.

The proposed model reached a good quality for the test of the hypotheses and all hypotheses were confirmed. The suitability index of the model (GoF) was 0.416, indicating a good fit. Hair et al. (2014) also indicate that the accuracy indices (Stone-Geisser Indicator, or  $Q^2$ ) and predictive relevance of the variables ( $f^2$ ) should be observed for the evaluation of the model. These parameters confirm the good fit of the model. The dependent variables ‘Impulse purchase’ and ‘Satisfaction’ obtained significant accuracy (0.175 and 0.26), which, together with the explained value of these variables ( $R^2$ ) of 31.7% and 37.8% respectively, allow us to conclude the acceptance of the proposed model.

The other variables also obtained satisfactory adjustment indicators. Positive emotions differed significantly in achieving better results among the independent variables ( $Q^2 = 0.125$ ,  $R^2 = 23\%$  and  $f^2 = 0.566$ ). In this sense, it was observed that the negative emotions obtained power of satisfactory explanation of the model. Negative emotions, although they were highlighted as a predictive variable of the model ( $f^2 = 0.288$ ), seem to have been less explained ( $Q^2 = 0.066$ ,  $R^2 = 14.5\%$ ), even though they were within the established parameters (Hair et al., 2014).

According to Stokols (1972), crowding perception is the emotional response to stress caused by the density condition in which the consumer loses control of his individual space and the situation goes beyond the acceptable limit. The perception of crowding was a relevant variable in the explanation of the model ( $f^2 = 0.288$ ), indicating that the manipulation of the context was adequate, and establishing the importance of the phenomenon for understanding retail consumption and its relations with other variables as a trigger for emotions that consumers experience in purchase situations.

The opposition variable, one of the dimensions of coping strategies that the consumer uses to deal with negative emotions, although having obtained a lower explained value ( $Q^2 = 0.019$ ,  $R^2 = 3.6\%$ ), was relevant in explaining the model ( $f^2 = 0.358$ ). It is a difficult phenomenon to identify, but it has great capacity to contribute to the understanding of situations of consumption involving negative emotions. Consumers, when

experiencing negative sensations in the retail environment, are expected to convey these feelings to their behavioral intentions. Therefore, strategies that the consumer adopts to address these negative emotions are of great interest to researchers and retail professionals.

In order to analyze the role of opposition as one of the coping strategies in retail, we analyze the mediation of this variable for the relationship between negative emotions (H3) and consumer responses such as impulse purchase (H4) and satisfaction (H5), hoping it would be able to reduce the effect of the negative emotions aroused by Crowding Perception (H1).

The retail environment deals with the emotions of consumers. Bagozzi (1982) presents, in his research, that emotion can have a positive influence on human behavior, since cognition is directly influenced by emotion. For Baker and Wakefield (2012), positive emotions may be a result of the perception of crowding. In the work of Jones et al. (2010), the emotional variables are understood as mediators and the perception of crowding exerts influence on the negative emotions in the works of Dion (2004). Eroglu et al. (2005), Li et al. (2009), Jones et al. (2010), in addition to Baker and Wakefield (2012), point to stress as the emotion that receives the most influence of human density.

Negative emotions in retail can arise from the perception of crowding (H1+:  $\Gamma = 0.141$ ,  $t = 3.059$ ,  $p < 0.002$ ), which at the same time reduces the perception of positive emotions (H2:  $\Gamma = -0.139$ ,  $t = 2.135$ ,  $p = 0.033$ ). This inverse effect simultaneously undermines the efficiency of retailers’ strategies, especially in situations that may be beyond their control, such as the large influx of consumers to stores. The more positive the emotions, the better the consumer responses. In this study, this was verified for both impulse purchase (H7+:  $\Gamma = 0.390$ ,  $t = 8.999$ ,  $p < 0.001$ ) and satisfaction with purchases (H6+:  $\Gamma = 0.579$ ,  $t = 0.154$ ,  $p < 0.001$ ). Therefore, the challenge for researchers and retail professionals is how to understand the negative emotions of consumers in their consumer experiences and find ways to mitigate their effects.

One way to reduce the effects of crowding perception is to find consumers who have personality traits that can understand and tolerate crowded phenomena more than other consumers in the spaces they share.

In this study, we observed that crowding tolerance was able to reduce the negative effects of crowding perception. However, crowding tolerance did not show significant effects on positive emotions (H2:  $\Gamma = 0.081$ ,  $t = 1.407$ ,  $p = 0.160$ , original CP path PE,  $\Gamma = -0.242$ ,  $t = 5.352$ ,  $p < 0.001$ , for  $\Gamma = -0.099$ ,  $t = 2.312$ ,  $p = 0.021$ , H2, with moderation of crowding tolerance), but, perhaps more importantly, it significantly moderated the relationship between crowding perception and its potentiating role of negative emotions, reducing the strength of this relationship (H1+:  $\Gamma = -0.139$ ,  $t = 2.135$ ,  $p = 0.033$ , original CP path  $\Gamma = 0.3131$ ,  $t = 4.801$ ,  $p < 0.001$ , for  $\Gamma = 0.141$ ,  $t = 3.059$ ,  $p < 0.002$ , Moderated by crowding tolerance). These results indicate that the effects of negative emotions are less felt by a specific group of consumers. In this study, an alternative way to deal with phenomena of this nature was presented.

There were no significant relationships between negative emotions and satisfaction (H5+,  $\Gamma = -0.046$ ,  $t = 0.1031$ ,

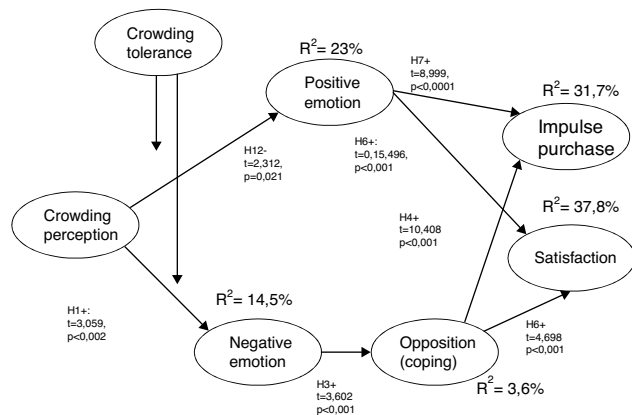


Fig. 3. Final theoretical model.

$p = 0.303$ , without opposition mediation), not even with impulse purchase (H4+:  $F = 0.038$ ,  $t = 0.782$ ,  $p = 0.435$ , without opposing mediation), although they emerged the expected direction. However, the role of opposition, as a strategy to deal with negative emotions in retail, proved to be valid, indicating an indirect relation both to Satisfaction (Sobel Test = 2.859,  $p < 0.004$ ) and to impulse purchases (Sobel = 3.406,  $p < 0.001$ ). These alternative paths, Negative Emotions → Opposition → Satisfaction, or Impulse purchase, represent an option for understanding the possible responses of consumers in situations of negative emotions. The dimension of opposition coping is situational, as was presented in the works of Lazarus and Folkman (1984), Skinner et al. (2003), Duhachek (2005), and Duhachek and Oakley (2007).

Fig. 3 presents the structural model proposed and tested in this study, with the main indicators of the final result.

In a more relevant way, the final structural model presents the moderation of crowding tolerance as a trait that decreases negative sensations due to high density, confirming previous studies (Machleit et al., 2000; Pan & Siemens, 2011). The model

proposes the mediation of the opposition dimension of the coping strategy when negative emotions are related to consumer responses in a high density context. To regulate the stress generated by the high density the consumer blames the retailer (opposition dimension of coping). We believe that the consumer expects the retailer to assume this guilt, and that, if this happens, the emotional balance is restored by a mechanism of empathy, resulting in a better consumer-retail relationship.

Purchase orientation (Baker & Wakefield, 2012) may be subject to negative emotions aroused by aspects of the environment that are beyond consumers' control. In the case of negative emotions, when purchase orientation is an important motivation, the consumers use coping mechanisms to achieve their goal (Duhachek & Oakley, 2007).

Taken together, these results validate the proposed conceptual model and, more than that, point out ways to understand the effects of crowding perception; particularly, its influence on the emotions and, consequently, on consumer responses within the retail environment. Dealing with the stress of negative emotions in a crowded retail environment is one way the consumer finds to re-establish their cognitive and emotional balance. Table 5 presents a summary table of the findings and contributions of this study.

The findings of this study shed light on the influence of crowding on consumer responses in the retail environment and mechanisms of regulation of the emotions experienced. The strategies adopted by consumers to deal with negative emotions in high-density environments work as a means for the shopping experience to continue, despite negative emotions.

### Final considerations

The objective of this study was achieved, since the results obtained demonstrated how consumers respond to the increased perception of crowding and crowding's impact on emotional

Table 5  
Synopsis table of the study.

Construct	Theory	Authors	Results
Crowding perception	An emotional reaction caused by high-density stress, often generating negative emotions	Stokols (1972), Dion (2004), Eroglu et al. (2005)	Great relevance in the model ( $f^2 = 0.288$ ), leading to negative responses
Crowding tolerance	Characteristic trait of people who can withstand crowding more	Machleit et al. (2000), Pan and Siemens (2011)	It exerts a moderating role, reducing the negative influence of perceived crowding
Negative emotions	Path expected when in high density, leading to negative responses from the consumer	Baker and Wakefield (2012), Li et al. (2009), Jones et al. (2010)	Greater expected relevance, which was not proven in the model, due to the moderating role of crowding tolerance
Positive emotions	Alternative path, even at high density, increasing positive consumer responses	Li et al. (2009), Jones et al. (2010)	Greater relevance than the expected path ( $f^2 = 0.566$ ), leading to more favorable responses
Coping (opposition)	Consumer strategy to deal with stress	Luce et al. (2001), Skinner et al. (2003), Duhachek (2005), Duhachek and Oakley (2007)	Good relevance in the model ( $f^2 = 0.358$ ), acting as mediator between negative emotions and consumer responses, reducing the negative effect of these emotions

Source: the authors.

and consumer responses. The mediating role of the opposition coping strategy and the moderation of crowding tolerance emerged as important mechanisms in this process.

Although human density has been much studied, it is believed that there is much to be researched on the subject in relation to the retail environment and consumer behavior, which contributes to the marketing area. Therefore, this work is part of the beginning and not the conclusion of the effect of human density on the consumer. Its continuity can help discover new avenues to be explored by marketing, crowding and other dimensions of coping.

Based on the coping scale of Skinner et al. (2003), Duhachek (2005), and Duhachek and Oakley (2007), we suggest new research analyzing the other dimensions of coping and their relationships, as well as the perception of crowding and negative emotions. We also suggest identification of other variables moderating the effects of crowding perception, mediators of negative emotions, and consumer responses.

This study contributes to the literature by testing the perception of crowding and negative emotions, previously untested using coping dimensions. Two paths are established in the shopping experience in high density environments and, even if one of them is loaded with negative emotions, which could translate into unfavorable responses, this study shows that the consumer can adopt strategies to deal with this discomfort and continue in the retail experience (Duhachek & Oakley, 2007). The results of this research encourage new studies on consumer responses in the condition of negative and positive emotions, as suggested by Baker and Wakefield (2012). The presented model can be tested in multi-groups with experiments that manipulate negative or positive emotions.

For retailers, this study contributes to the management of marketing strategies at the point of sale. This article tests the relationship between promotions that crowd stores and customers' impulsive behavior, generating positive emotions but ultimately setting up high-density contexts that arouse negative emotions. It is suggested that managers, aware of these influences on consumer responses, adopt actions that make consumers more tolerant of the perception of crowding in their shopping experience, such as the creation of rest areas, queue management, or circulation improvement.

Another point that should be taken into account by managers is that tools can help consumers self-regulate their negative emotions in high-density human environments, leading to closeness and non-withdrawal (Duhachek & Oakley, 2007). The use of teams for interaction with consumers, to aid in purchase situations, as well as to show empathy, can potentially assist in the mechanism of coping with stress generated by high density.

Based on the coping scale of Skinner et al. (2003), Duhachek (2005), and Duhachek and Oakley (2007), new research is suggested to analyze the other dimensions of coping and its relation with the perception of crowding, negative emotions, and responses of the retail consumer. It is also suggested to identify other variables moderating the effects of crowding perception and mediators of negative emotions.

## Conflicts of interest

The authors declare no conflicts of interest.

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