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## Effects of Atmospherics on Emotions and Intention with Respect to Involvement under Different Shopping Environments

**The present study deals with the S–O–R framework.** The past five decades of research have successfully validated the S–O–R model in offline and online contexts. However, there is still room for improvements. In particular, hedonic aspects have been proposed as distinctive aspects to differentiate companies. Previous researchers have (i) been somewhat reluctant to investigate dominance and other emotional responses; and (ii) produced mixed results regarding the impact of atmospherics and emotional responses on behavior. Building on this tradition of research, this study investigates the S-O-R model by incorporating delight as an attitudinal emotional response and tests the moderating effects of consumers' involvement and shopping environment (three-way interactional effects) in connection with the links among atmospherics, emotions and intentions. The current findings demonstrate that the model fits better for low involvement consumers than for high involvement consumers. This was true for both offline and online environments. The theoretical and practical implications are discussed in the conclusions.

### **1. Introduction**

Understanding how atmospheric stimuli can influence consumer behavior has been the object of numerous studies. Although the term atmospherics appeared for the first time associated with the retail sector in the seminal work of Kotler (1973-1974), it was only with Donovan and Rossiter (1982) that research in this field became prominent. Donovan and Rossiter (1982) introduced the Mehrabian and Russell (1974) framework, i.e., the stimuli, organism, and response model, suggesting which variables are relevant in retail settings.

During the last decades of the 20<sup>th</sup> century and the first decade of the 21<sup>th</sup> century, several researchers have explored what and how atmospheric cues can affect the emotional state of consumers and their subsequent purchasing behavior, both for traditional offline stores (e.g., Baker, Grewal, & Parasuraman, 1994; Donovan, Rossiter, Marcoolyn, & Nesdale, 1994; Sherman, Mathur, & Smith, 1997) and, more recently, for online web stores (e.g. Eroglu, Machleit, & Davis, 2003; Koo & Ju, 2010).

Based on an extensive review of the literature, Turley and Milliman (2000) established five broad categories of atmospheric cues: external (e.g., architectural style and surrounding stores); interior (e.g., flooring, lighting, color schemes, music); layout and design (e.g., space design and allocation, grouping, traffic flow); point of purchase and decoration (e.g., signs, cards, wall decorations, price displays); and human variables (e.g., employee characteristics, uniforms, crowding and privacy). However, these atmospheric cues are more appropriate in the context of offline stores. Later, Koo and Ju (2010), after a review of the literature on atmospheric cues in the context of online web stores, conceptualized them using computer and human factors and established four categories for online stores: graphics (e.g., fun, looks nice, beautiful, visually comforting); colors (e.g., use of distinctive color, visually appealing, colors used to distinguish important content); links (e.g., buttons to help find products/services,

convenient links to move into sub-sites); and menu (e.g. clean and neat, segmentations quite satisfying, fit with the website design, consistent with the overall style).

Arousal and pleasure are usually the positive emotions that mediate atmospherics and customer intentions. Delight is another positive emotion, a second order emotion (Plutchik, 1980), which is characterized by a combination of first order emotions, such as arousal and pleasure or positive affect. Indeed, Oliver, Rust & Varki (1997), in their seminal work, proposed a model of consumer delight, whereby a surprising consumption experience can initiate arousal, which then leads to pleasure (positive affect), which, in turn, leads to consumer delight. As a consequence, delight is a direct determinant of future intentions. Later, Kumar, Olshavsky, and King (2001) claimed that consumers can be delighted even when they were not surprised.

Nowadays, in concomitance with the path, sequence starting in atmospheric cues, following by emotions, and ending with intentions, researchers has been used moderators effects of consumer characteristics.

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Thus, the level of involvement of the consumer in shopping and age difference are proposed to be moderator variables adopted in the present study. The involvement in shopping intention analyzes possible differences that occur when consumers are more interested in shopping, compared with those for whom shopping is less interesting or does not matter. Researchers tend to study younger consumers more than older consumers (e.g., Roberts & Zhou, 1997; Szmigin & Carrigan, 2001; Zhang, 2005), especially in the online context, because managers tend to give more importance to individuals younger than 50 years old; individuals older than 50 years old are supposed to be less interested or have fewer skills in using web stores (e.g., Selwyn, Gorard, Furlong, & Madden, 2003).

In this vein, the current study introduces the second order emotion, delight, in the traditional sequence of atmospheric cues to emotions and intentions (loyalty and word-of-mouth), establishes a set of atmospheric cues to test the model giving attention to both offline and online stores, and hypothesizes that involvement in shopping and age moderate the interrelationship among atmospheric factors, emotions, and future intentions.

This article is structured as follows. First, we present a review of the S–O–R (stimuli, organism, and response) framework, atmospheric factors, pleasure, arousal, and delight as emotional responses, future intentions, and involvement in shopping and age as moderators. Second, the research model and hypotheses are introduced to compare offline and online shopping, followed by method and results. Finally, we discuss the results, present the conclusions, and point out future research avenues.

## **2. Literature review**

### ***2.1. Stimuli–Organism–Response Model***

The current study is based on the S–O–R model, presented in the context of environmental psychology by Mehrabian and Russell (1974) and first applied to the retail context by Donovan and Rossiter (1982). These authors investigated the relationship between emotional states induced by several different environments and behavioral intentions. In this application, the stimuli were operationalized as components of the atmosphere, the organism as consumers' emotional states (such as pleasure and arousal), and the response as attitudes and behavioral intentions (approach and avoidance) (Donovan & Rossiter, 1982). Thus, an adequate S-O-R framework should examine three elements: taxonomy of stimulus, organism, and taxonomy of responses (Donovan & Rossiter, 1982). This model also suggests that the stimuli precede and affect the consumers' emotional states (organism), which influence their

retail behaviors (responses), such as re-patronage, store search, and in-store behavior (Thang & Tan, 2003).

The stimulus is the set of characteristics inside the environment that affects the internal states of the individuals (e.g., Baker, Levy, & Grewal, 1992; Eroglu, Machleit & Davis, 2001; McKinney, 2004; Sherman, Mathur, & Smith, 1997). Organism refers to the intervening internal process, which takes place between the stimulus and the final actions, causing alterations in the emotional states of the consumer. That process allows the consumers to convert the stimulus into meaningful information and utilize that information to understand the environment before making a decision (Koo & Ju, 2010). The response is used to express satisfaction or dissatisfaction with the consumer experience (McKinney, 2004); according to Donovan and Rossiter (1982), that response can be through approach and avoidance behaviors.

The S-O-R model has been applied and tested extensively in traditional offline retailing (e.g., Baker, Grewal, & Parasuraman, 1994; Donovan & Rossiter, 1982; Donovan, Rossiter, Marcolyn, & Nesdale, 1994; Sherman, Mathur, & Smith, 1997; Turley & Milliman, 2000; Kaltcheva & Weitz, 2006), and some researchers (e.g., Dailey, 2004; Koo & Ju, 2010; Eroglu, Machleit, & Davis, 2003; McKinney, 2004; Mowen & Minor, 2001; Mummalaneni, 2005; Wu, Cheng, & Yen, 2008) have shown that the paradigm is valid for online retailing.

## **2.2. Atmosphere**

Nowadays, shopping is no longer a synonym for merely buying products (Manganari, Siomkos, & Vrechopoulos, 2009). Consumers tend to share their ideas about which stores are more attractive than others—some of the stores induce feelings of well-being, while others are annoying or even boring (Spies, Hesse, & Loesch, 1997). Therefore, retailers are investing more to create a pleasant store atmosphere in

order to contribute to positive shopping results (Manganari, Siomkos, & Vrechopoulos, 2009).

The first definition of atmosphere emerged in the 1970s. According to Kotler (1973-1974, p. 50), atmosphere is the "silent language" of communication and the result of "the conscious designing of space to create certain buyer effects". It reflects the effort of creating retail environments that are intended to produce certain emotional effects on the buyer and increase the likelihood of purchase.

Dailey (2004) adopted the definition of Kotler (1973-1974) and suggested that the atmospheres of virtual web stores are the conscious design of environments for creating positive effects on users in order to increase their favorable responses.

According to Milliman and Fugate (1993) and Koo and Ju (2010), atmosphere is any component in a retailing environment, regarded as external to the individual, but perceived within the perceptual field, stimulating senses and affecting the totality of the experience of being in a certain place at a certain time. Thus, in the context of a traditional offline store, atmospheric cues are the physical elements or characteristics of the store's interior that determine its atmosphere. Such characteristics may include, among other things, lighting, colors, and music (Vrechopoulos & Siomkos, 2002). On the other hand, in the virtual environment, atmospheric cues can be defined as the sum total of all the stimuli that are visible and audible to the consumer (Eroglu, Machleit, & Davis, 2001).

In the present study, we assume that physical and virtual atmospheres comprise the same number of components: design, layout, and information.

The design factor is the most visual element in the environment (Baker, Grewal & Parasuraman, 1994); it is constituted of elements such as architecture, decoration, colors scheme, and overall design (Wakefield & Baker, 1998).

The layout is the website or store configuration that can be analyzed through the ease of finding goods/services, their variety and disposition, and the facility of movement within the store or website. The layout variable has great importance in the virtual atmosphere because the layout of the website defines the route the consumer has to follow (Manganari, Siomkos, & Vrechopoulos, 2009). The layout and functionality of the space becomes more important when consumers have to perform more complex tasks or are under time pressure (Bitner, 1992). Thus, the layout should be clear but not too simple, and should have the possibility of unpredictability and surprise (Spies, Hesse, & Loesch, 1997).

The presence of information on websites and stores is reflected by the amount, importance, and availability of information about goods and services, as well as forms of payment. The existence of this variable in the environment plays an important role in the decision-making process of consumers (Novak, Hoffman, & Yung, 2000).

### ***2.3. Pleasure and Arousal***

The conceptualization of emotional states (pleasure and arousal) as the organism has been developed in certain studies (e.g., Donovan & Rossiter, 1994; Kaltcheva & Weitz, 2006; Koo & Ju, 2010; Mummalaneni, 2005; Sherman, Mathur, & Smith, 1997). The emotional states analyzed in some studies in retailing focus on three dimensions—pleasure, arousal, and dominance—as a result of exposure to atmospheric cues. However, to Russell and Mehrabian (1976) arousal and pleasure explain most of the variances and, according to Donovan and Rossiter (1982), dominance is a redundant variable. Russell (1979) and Eroglu, Machleit, and Davis (2001) suggest that arousal and pleasure adequately capture the range of appropriate emotional responses.

Later, Koo and Lee (2011) assumed dominance and arousal as important informational cues, which determine pleasure and subsequent behavior intentions.

Instead of dominance or control in the sense of feeling influential, autonomous, and free when shopping, the present study uses information factors as informational cues, which can contribute to a sense of control in a consumer's mind.

Pleasure is defined as “the degree to which a person feels good, joyful, happy, or satisfied in a situation” (Menon & Kahn, 2002, p. 32). Pleasure is the hedonic valence (pleasant or unpleasant) of the affective response to a stimulus, based on the extent to which the stimulus enables people to achieve its main objectives (Kaltcheva & Weitz, 2006). So, in the present study, pleasure is defined as the degree to which a person feels contented or happy in a specific store or website.

Arousal, which is related to the degree of stimulation caused by the atmosphere, is defined as the extent to which a person feels excited, alert, and active (e.g., Baker, Levy, & Grewal, 1992, Menon & Kahn, 2002; Wu, Cheng, & Yen, 2008). This activation reflects the affective dimension that ranges from sleep to frantic excitement (Kaltcheva & Weitz, 2006). In this study, the concept is defined as the degree to which an individual who visits a store or uses a website feels stimulated and awake.

According to Kaltcheva and Weitz (2006), retailers should create a high-arousal environment for recreational consumers because high arousal is more effective than low arousal for creating a positive effect on pleasure and increases the consumer's intention to visit the store and shop.

The influence of emotional states on response is also supported by Koo and Ju (2010). Their study results confirm that virtual atmospheric cues have a positive impact on pleasure and arousal, and both have subsequent effects on the intention to continue to use the virtual store.

However, emotional states do not always influence the results in the same way. For Mummalaneni (2005), the number of items purchased is affected by pleasure but not by

arousal, and the time spent in the store is influenced by arousal but not by pleasure. Yet, both emotional states (arousal and pleasure) influence consumer satisfaction while shopping. However, Patterson (1997) argued that consumer delight implies going beyond satisfaction and providing the consumer with a pleasant experience, with consumer delight being the best tool to increase the level of customer retention. For this reason, the current study uses delight as a consequence of arousal and pleasure.

#### ***2.4. Delight***

Emotional theories in the social psychology field describe delight as a second order emotion, characterized by a combination of a number of first order emotions. According to Plutchik (1980), there are eight basic emotions that may be collapsed into four dimensions with opposite poles (sadness – happiness; surprise – anticipation; acceptance – rejection; and anger – fear). By combining these basic emotions, more complex emotions arise. According to this theory, a secondary dyad is defined as a combination of two basic emotions that generate a more complex emotion. Delight would thereby be defined as a secondary dyad comprised of joy and surprise.

Other emotional theories define delight as a combination of arousal and pleasure (Russell, 1980), or as a positive affect implying a high level of activation (Watson & Tellegen, 1985). Furthermore, Richins (1997) identified the most outstanding emotions in marketing studies on consumption and included delight in the category of "joy".

Oliver et al. (1997) pointed out that the arousal and positive affect (pleasure) are antecedents of delight. They also hypothesized that delight creates a desire for further pleasurable service in future intentions.

#### ***2.5. Intention and word-of-mouth***

Intention is the response, the final result or consumer reaction, including psychological reactions such as attitudes and/or behavioral responses (Koo & Ju, 2010).

It is used to express satisfaction or dissatisfaction of consumers with their consumption experience (McKinney, 2004). To Mehrabian and Russell (1974) and Eroglu et al. (2003), for example, the behavioral response of individuals to the environment can be characterized by approach or avoidance behavior. The former is seen as a positive response reflected in the "physical" desire to stay—the will to continue to explore the environment and the desire to communicate with other people in the environment, for example, through the readiness to buy, spend more money than originally planned, and interact with employees (e.g., Baker, Levy, & Grewal, 1992; Donovan & Rossiter, 1982, Turley & Milliman, 2000; Vrechopoulos, 2001). Avoidance behavior is reflected in the "physical" desire to leave a certain space, reduce or cease consumption behaviors, and avoid interaction and communication with others in the environment (e.g., Donovan & Rossiter, 1982; Turley & Milliman, 2000). Companies should aim to encourage approach behaviors of consumers and inhibit avoidance behaviors (Bitner, 1992).

The current study explores positive responses, using intentions and word-of-mouth. In fact, we use the expression “intentions” as the behavioral indicator of intentions to use, visit, and buy in the future and “word-of-mouth” as the attitudinal indicator or the intention to speak well of, recommend, and encourage others to visit the website or the store.

## ***2.6. Involvement in shopping and age as moderators***

The moderators presented in this study are involvement and age. Whenever a variable has the effect of systematically modifying either the form and/or the strength of the relationship between a predictor and a criterion variable, it is designated as a mediator (Sharma, Durand, & Gur-Arie, 1981).

According to Zaichkowsky (1985, p. 342), involvement is “a person’s perceived relevance of the object based on inherent needs, values and interests”, and it could be

situational (temporary) or enduring (lasting) (Wakefield & Baker, 1998). The degree to which a person is involved, engaged, or views the message as important drives consumer's inherent motivation to attend to a retailer's communication (Puccinelli et al., 2009).

Puccinelli et al. (2009) indicated that a person is highly involved in the decision when she or he pays more for something, is responsible to others for the decision, or makes a personally important decision. Consumers who are highly involved are interested in gaining more information about the good or service and process that information carefully in order to make the right decision. These authors also indicated that low involvement consumers are influenced by basic positive or negative stimulus and engage in superficial processing.

In summary, previous research indicates that individuals tend to get more excited about things that they enjoy doing (e.g., Mano & Oliver, 1993; Wakefield & Blodgett, 1994). On the other hand, individuals who do not enjoy the shopping activity have less inclination to shop and so are apt to be less excited about the experience and the associated environment (Wakefield & Baker, 1998). Thus, individuals who feel more interested in shopping will explore the shopping environment and experience emotions differently than those who feel less interested in shopping.

Individuals tend to value objects, services, and even other individuals differently over the course of their lives. As a result, the perception of the atmospheric cues and the emotions felt by a younger customer are likely to be different from those of an older customer. Indeed, compared with younger people, older people show higher emotional control and maturity (Lawton et al., 1992; Carstensen et al., 2000). Carstensen et al. (2000) examined momentary levels of positive and negative emotions of participants

aged 18–94 and found that older participants experienced greater stability of positive emotional states than did younger participants.

Applying the moderating variables, the present study intends to contribute to a better understanding of the effect of the level of involvement in shopping and age in the process of visiting or using physical and web stores.

### 3. Research model

The proposed research model is shown in Fig.1. The model is based on the S–O–R model from the environmental psychology perspective. In the current research, the stimuli are operationalized as atmospheric cues (design, layout, and information) present on the websites or in the stores, the organism is the emotions that consumers feel, and the responses are operationalized as consumers’ intentions to re-visit the store or re-use the website and provide positive word-of-mouth to others. Delight is viewed as a function of arousal and pleasure based on the emotion theory of Russell (1980) and on the model proposed by Oliver et al. (1997).

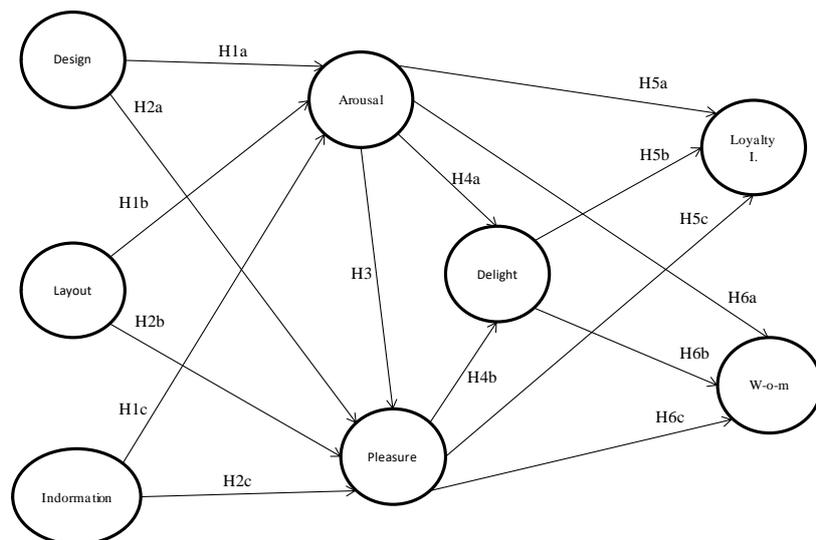


Fig.1. Proposed model.

Atmospheric factors have been seen as those having a positive effect on emotions, such as arousal and pleasure (e.g., Lin & Lu, 2000; Mummalaeni, 2005;

Davis, Wang, & Lindridge, 2008; Ha & Stoel, 2009; Koo & Ju, 2010). In this way, we hypothesize:

**H1: Design factor (H1a), layout factor (H1b), and information factor (H1c) have a positive effect on arousal.**

**H2: Design factor (H2a), layout factor (H2b), and information factor (H2c) have a positive effect on pleasure.**

Several studies have found a direct and positive relationship between arousal and pleasure, especially when regarding a high-arousal object that operates as a mechanism of activation (e.g., Mano & Oliver, 1993; Sherman et al., 1997; Oliver et al., 1997).

**H3: Arousal has a positive impact on pleasure.**

Delight is viewed as a second level emotion, characterized by a combination of high pleasure and high activation (arousal) (Russell, 1980; Watson & Tellegen, 1985). In the studies of Mano and Oliver (1993) and Oliver et al. (1997), delight is found to be affected by pleasure (or positive affect) and arousal. Thus, the following hypothesis is proposed:

**H4: Delight is positively affected by arousal (H4a) and pleasure (H4b).**

In the S-O-R model, responses are the result of emotions, and empirical studies have shown such relationships (e.g., Menon & Kahn, 1995; Eroglu et al., 2003; Koo & Ju, 2010). Delight is also viewed as an emotion that impacts positively on future intentions (Oliver et al., 1997; Loureiro & Kastenholtz, 2011).

**H5: Loyalty intention is positively affected by arousal (H5a), delight (H5b), and pleasure (H5c).**

**H6: Word-of-mouth is positively affected by arousal (H6a), delight (H6b), and pleasure (H6c).**

Finally, based on the literature review of the last section, we expect that individuals with high and low involvement in shopping, as well as younger and older individuals, need different levels of stimulation and perception of atmospheric factors, which lead to different emotional responses and even future intentions. Younger consumers tend to be emotionally less stable and will need more stimulation from atmospheric factors. In addition, low involvement consumers will have less energy and intention to concentrate on shopping and thus need more stimulation.

**H7: The strength of the interrelationships among atmospheric factors, emotions, and future intentions will be different for consumers with high and low involvement in shopping.**

**H8: The strength of the interrelationships among atmospheric factors, emotions, and future intentions will be different for younger and older consumers.**

In addition, the present study intends to contribute to a better understanding of the potential differences and similarities in consumers' perceptions of the atmospheric cues, emotions, and intentions under different environments such as the online and offline contexts, as proposed by Puccinelli et al. (2009) in their literature review and following the work of Koo and Lee (2011). Thereby, each hypothesis will be compared regarding offline and online environments.

#### **4. Methodology and data analysis**

##### ***4.1. Measures***

In the present study, we built a questionnaire adapted from the previous literature and validated with a pilot test. For the pilot test, 10 traditional university students and 10 retired senior university students with experience of both online websites and offline stores over the last three months (Koo & Ju, 2010) helped with the

content validity and psychometric properties of the measures. All responses to items were made using a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree) with the exception of demographics. The questionnaire's construct, items, and sources are shown in Table 1. The questionnaire also contained several questions about the degree of involvement in shopping, using a five-point Likert-type scale, and items such as "In general, going shopping is interesting" or "matters to me", based on Wakefield and Baker (1998) and Zaichkowsky (1985).

**Table 1** The questionnaire's construct, items, and sources

Construct	Measurement scale		Source
	Online	Offline	
Design factor	1D: The website's architecture gives it an attractive character 2D: The website is decorated in an attractive fashion. 3D: The website color schemes are attractive. 4D: The overall design of the website is interesting.	1D: The store's architecture gives it an attractive character 2D: The store is decorated in an attractive fashion. 3D: The store color schemes are attractive. 4D: The overall design of the store is interesting.	Adapted from Wakefield and Baker (1998)
Layout factor	1L: The website layout makes it easy to get to the good/service I want. 2L: The website has an excellent range of goods/services. 3L: The website graphics/images are visually attractive. 4L: The website allows us to easily navigate. a	1L: The store layout makes it easy to get to the good/service I want. 2L: The store has an excellent rang of goods/services. 3L: The layout of products and equipments is visually attractive 4L: The store layout makes it easy to get around. A	Based on Turley and Milliman (2000) and Wakefield and Baker (1998)
Information Factor	1Inf: The website information about goods/services is sufficient 2Inf: The information inside the website is relevant. 3Inf: The website has information about different products. 4Inf: The website information about forms of payment is sufficient.	1Inf: The store information about goods/services is sufficient 2Inf: The information inside the store is relevant. 3 Inf: The store has information about different products. 4 Inf: The store information about forms of payment is sufficient.	Adapted from Hausman and Siekpe (2009)
Arousal	1E: Using the website I feel aroused 2E: Using the website I feel wide awake	1E: Visiting the store I feel aroused 2E: Visiting the store I feel wide awaked	Adapted from Koo and Ju (2010) and Donovan and Rossiter (1982)
Pleasure	1P: Using the website I feel contented 2P: Using the website I feel happy 3P: Using the website I feel pleasure	1P: Visiting the store I feel contented 2P: Visiting the store I feel happy 3P: Visiting the store I feel pleasure	Adapted from Koo and Ju (2010) and Donovan and Rossiter (1982)
Delight	1S: Using the website I feel delighted	1S: Visiting the store I feel delighted	Based on Oliver et al. (1997) and Finn (2000)
Word-of-mouth	1Int: I will speak well about the website to other people. 2Int: I will recommend the site if someone asks for my advice 3Int: I will encourage my friends and relatives to visit the website	1Int: I will speak well about the store to other people. 2Int: I will recommend the store if someone asks for my advice 3Int: I will encourage my friends and relatives to visit the store	Adapted from Zeitham et al. (1996) and Hausman and Siekpe (2008)
Loyalty intention	4Int: I intend to use the website in the future 5Int: I will buy goods/services in this site in the future 6Int: I prefer this website to others (with the same goods/products)	4Int: I intend to visit the store in the future 5Int: I will buy goods/services in this store in the future 6Int: I prefer this store to others (with the same goods/products)	Adapted from Hausman and Siekpe (2008)

a This item measuring layout (offline and online) has been screened out during the measurement model test, since it has a low factor loading score.

#### ***4.2. Survey and sample***

The survey was conducted from April to June 2010 in Lisbon and Porto, the two major cities in Portugal, as well as in Aveiro and Leiria, two secondary cities. Consumers in shopping centers, universities, and senior universities were approached by trained interviewers. People in senior universities are groups of retired people that group in a network in Portugal in order to learn several fields of knowledge from laws to computers skills, as they like and wish.

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In this vein, the sample was a portion of the general population who had experiences visiting offline stores and using websites in the last three months. We considered both hedonic and utilitarian store brands, such as car dealers, supermarkets, travel agencies, and clothing stores. We also examined stores that are mostly self-serve (such as supermarkets) and others that provide more intensive service (such as car dealers).

Of the 400 questionnaires distributed, 363 valid completed questionnaires were used for analysis, resulting in a valid response rate of 90.7%. For this study, we invited participants who use offline and online stores of the same organization or brand. Thus, each participant first answered a question asking them to think of an offline store and then, after a pause, an online store (within subject design). Almost two-thirds of the respondents were female (61.2%). Fifty percent were between 18 and 30 years old, and 30% were older than 50 years old (20% were older than 60 years old). Regarding involvement in shopping, 34.2% were high involvement consumers and 28.7% were low involvement consumers.

#### ***4.3. Data analysis***

A structural equation model approach using partial least squares (PLS) (Ringle et al., 2005) was employed to test the hypotheses of the current study. PLS is based on an iterative combination of principal components analysis and regression, and it aims to explain the variance of the constructs in the model (Chin, 1998). So, PLS employs a component-based approach for estimation purposes (Lohmoller, 1989) and can readily handle formative factors (Chin et al., 2003). PLS also places minimal restrictions on the sample's size and residual distributions (Chin et al., 2003; Wold, 1982) and supports a pooled significance test for multi-groups (Wetzels, Odekerken-Schröder, & van Oppen, 2009). In general, PLS is more appropriate for explaining complex relationships than it is for explaining simple relationships because it avoids two problems: inadmissible solutions and factor indeterminacy (Fornell & Bookstein, 1982).

In the present study, a non-parametric approach called “bootstrapping” was used to assess the precision of the PLS estimates and support of the hypotheses. Five-hundred samples sets were created to obtain 500 estimates for each parameter in the PLS model. Each new sample was obtained by a re-sample process and replacement of the original data set (Fornell & Larcker, 1981; Chin, 1998). Path coefficients, interpreted in a similar way to standardized betas, indicate the strength of the direct relationship between constructs. In addition to path coefficients, the bootstrapping procedure enables the determination of the respective standard error and t-statistics for path coefficients.

Tenenhaus et al. (2005) proposed the geometric mean of the average communality and the average  $R^2$  for endogenous constructs, which ranges from 0.00 to 1.00, as a global measure of goodness of fit (GoF) for PLS path modeling. GoF is calculated as follows;  $GoF = \sqrt{\text{communality} \cdot R^2}$ . This formula is equivalent to that proposed by Wetzels et al. (2009). Three different effect sizes for  $R^2$  have different

acceptable GoF values. The effect size for  $R^2$  ( $f^2$ ) proposed by Cohen and Cohen (1983) is determined by  $f^2 = R^2 / (1 - R^2)$ . Three effect sizes for  $R^2$  include small = 0.02, medium = 0.13, and large = 0.26. Following GoF criteria for each effect size, Wetzels et al. (2009) proposed  $GoF_{small} = 0.1$  or greater,  $GoF_{medium} = 0.25$  or greater, and  $GoF_{large} = 0.36$  or greater.

Finally, the differences between high involvement and low involvement in shopping and between older and younger consumers are compared by splitting the full sample using median and t-test, where  $m$  = low involvement or younger subsample size (group1) and  $n$  = high involvement or older subsample size (group 2), according to equation (1). This test uses the path coefficients ( $\beta$ ) and the standard errors (SE) of the structural paths calculated by PLS with each of the two subsamples.

$$t = \frac{(\beta_1 - \beta_2)}{Sp_x \sqrt{\left(\frac{1}{m} + \frac{1}{n}\right)}} \quad (1)$$

$$Sp = \sqrt{\left[ \frac{(m-1)^2}{(m+n-2)} \times SE_1^2 + \frac{(n-1)^2}{(m+n-2)} \times SE_2^2 \right]}$$

## 5. Results and discussion

### 5.1. Convergent and discriminant validity

A PLS model should be analyzed and interpreted in two stages. First, the measurement model or the adequacy of the measures (see Table 2 and 3) is assessed by evaluating the reliability of the individual measures, the convergent validity, and the discriminant validity of the constructs (Hulland, 1999). Then, the structural model is evaluated.

In order to evaluate the adequacy of the measures, this study used the aggregated data sets collected from offline and online stores, since the comparisons of the measure

models for desegregated data do not show statistical differences. So, item reliability is assessed by examining the loadings of the measures on their corresponding construct. Item loadings of scales measuring reflective constructs should be 0.707 or more, which indicates that over 50% of the variance in the observed variable is explained by the construct (Carmines & Zeller, 1979). Table 2 shows that all item loadings approach or exceed 0.736.

**Table 2** Item loadings and cross-loadings for offline data

Construct	Item	Loadings (t-value) and cross-loadings							
Design	1D	<b>0.847</b> <b>(8.250)</b>	0.474	0.372	0.134	0.166	0.157	0.409	0.321
	2D	<b>0.887</b> <b>(10.036)</b>	0.515	0.339	0.200	0.194	0.170	0.426	0.308
	3D	<b>0.826</b> <b>(6.240)</b>	0.526	0.349	0.132	0.139	0.172	0.399	0.315
	4D	<b>0.839</b> <b>(5.737)</b>	0.600	0.459	0.181	0.189	0.191	0.514	0.439
Layout	1L	0.454	<b>0.830</b> <b>(9.798)</b>	0.537	0.169	0.228	0.175	0.535	0.457
	2L	0.445	<b>0.834</b> <b>(9.018)</b>	0.526	0.181	0.200	0.180	0.506	0.433
	3L	0.630	<b>0.778</b> <b>(6.121)</b>	0.513	0.164	0.208	0.199	0.471	0.363
Information	1Inf	0.321	0.534	<b>0.781</b> <b>(4.867)</b>	0.154	0.120	0.129	0.522	0.452
	2Inf	0.389	0.506	<b>0.817</b> <b>(5.148)</b>	0.179	0.184	0.159	0.461	0.391
	3Inf	0.341	0.498	<b>0.737</b> <b>(4.523)</b>	0.140	0.134	0.171	0.383	0.295
	4Inf	0.318	0.452	<b>0.736</b> <b>(4.494)</b>	0.151	0.144	0.150	0.510	0.431
Arousal	1E	0.183	0.216	0.197	<b>0.901</b> <b>(36.666)</b>	0.631	0.362	0.272	0.251
	2E	0.164	0.158	0.167	<b>0.881</b> <b>(23.361)</b>	0.561	0.381	0.245	0.215
Pleasure	1P	0.188	0.230	0.149	0.591	<b>0.910</b> <b>(41.378)</b>	0.322	0.320	0.251
	2P	0.169	0.185	0.172	0.586	<b>0.891</b> <b>(31.979)</b>	0.394	0.293	0.215
	3P	0.191	0.278	0.192	0.610	<b>0.868</b> <b>(26.967)</b>	0.339	0.354	0.243
Delight	1S	0.204	0.226	0.198	0.416	0.395	<b>1.000</b> (-)	0.263	0.215
Word-of-Mouth	1Int	0.471	0.587	0.606	0.243	0.293	0.214	<b>0.914</b> <b>(30.358)</b>	0.683
	2Int	0.503	0.596	0.569	0.278	0.373	0.241	<b>0.942</b> <b>(52.446)</b>	0.710
Loyalty	3Int	0.463	0.539	0.523	0.281	0.335	0.272	<b>0.919</b> <b>(38.855)</b>	0.732
	4Int	0.384	0.488	0.463	0.264	0.262	0.221	0.729	<b>0.913</b> <b>(28.509)</b>
	5Int	0.341	0.413	0.416	0.222	0.224	0.143	0.647	<b>0.893</b> <b>(18.335)</b>
	6Int	0.370	0.474	0.487	0.212	0.223	0.206	0.675	<b>0.879</b> <b>(20.654)</b>

Composite reliability was used to analyze the internal consistency of the constructs, since this method is considered a more exact measure than Cronbach's alpha

(Fornell & Larcker, 1981). Nevertheless, Cronbach's alpha is also displayed in Table 3 for comparison purposes. As displayed in Table 3, all Cronbach's alpha values are above 0.7, and all composite reliability are above 0.8. So all constructs are reliable, since the composite reliability values exceed the threshold of 0.7 and exceed even the stricter threshold of 0.8 (Nunnally, 1978). The measures also demonstrate convergent validity as the average variance of manifest variables extracted by constructs (AVE) is at least 0.5, indicating that more variance was explained, rather than unexplained, in the variables associated with a given construct.

**Table 3** Measure model (reliability and discriminant validity)

Construct	Mean	C.R. (Alpha)	AVE	Correlations of constructs									
				D	La	I	A	P	Del	W	Lo		
Design (D)	3.6	0.912 (0.873)	0.722	<b>0.850</b>									
Layout (La)	3.6	0.855 (0.745)	0.663	0.624	<b>0.814</b>								
Information (I)	3.4	0.852 (0.769)	0.590	0.448	0.645	<b>0.768</b>							
Arousal (A)	3.3	0.886 (0.742)	0.795	0.195	0.211	0.205	<b>0.891</b>						
Pleasure (P)	3.4	0.919 (0.868)	0.792	0.206	0.261	0.193	0.670	<b>0.890</b>					
Delight (Del)	3.0	1.000 (1.000)	1.000	0.204	0.226	0.198	0.416	0.395	<b>1.000</b>				
W-of-m (W)	3.5	0.947 (0.916)	0.856	0.518	0.620	0.609	0.290	0.363	0.263	<b>0.925</b>			
Loyalty (Lo)	3.3	0.924 (0.876)	0.801	0.409	0.514	0.510	0.262	0.266	0.215	0.766	<b>0.895</b>		

C.R. – composite reliability; AVE – average variance extracted

Diagonal elements in the 'correlation of constructs' matrix are the square root of AVE. For adequate discriminant validity, diagonal elements should be greater than corresponding off-diagonal elements.

Finally, to assess discriminant validity, the square root of AVE should be greater than the correlation between the construct and other constructs in the model (Fornell & Larcker, 1981). Table 3 shows that this criterion has been met.

## 5.2. Structural results and multi-group analysis

The overall structural results for the offline and online models are presented in Table 4. Overall, the values of GoF and  $f^2$  statistics reveal that the model has a significant fit to the data collected and is more suitable for the online than for the offline context.

Hypothesis 1 and Hypothesis 2 proposed that atmospherics, such as design, layout, and information, have a positive effect on arousal (H1a to H1c) and pleasure

(H2a to H2c). The results found in Table 4 show that all atmospherics have no significant positive effect, either on arousal or on pleasure. These results imply that both H1 and H2 are not supported. With respect to Hypothesis 3, the model proposed a positive effect on pleasure. This hypothesis is supported ( $\beta_{\text{offline}} = .636$   $p=0.00$ ;  $\beta_{\text{online}} = .687$   $p=0.00$ ). H4a proposed that arousal has a positive influence on delight, which is supported ( $\beta_{\text{offline}} = .289$ ,  $p=0.01$ ;  $\beta_{\text{online}} = .289$ ,  $p=0.05$ ). However, hypotheses including H4b (pleasure to delight), H5a (arousal to loyalty), H5b (delight to loyalty), H5c (pleasure to loyalty), H6a (arousal to word-of-mouth), and H6b (delight to word-of-mouth) are not supported. Meanwhile, H6c proposed that pleasure has a positive impact on word-of-mouth. This hypothesis is supported ( $\beta_{\text{offline}} = .254$ ,  $p=0.05$ ;  $\beta_{\text{online}} = .271$ ,  $p=0.05$ ).

Globally speaking, the full model proposed in the present study demonstrated that (1) design, layout, and information do not have a significant impact on arousal and pleasure; (2) the effect of arousal on pleasure is significant and positive; (3) while arousal has a positive and significant impact on delight, there is no direct impact of pleasure on delight; and (4) concerning H5 and H6, only H6 is partially supported because pleasure has a significant and positive influence on positive word-of-mouth.

**Table 4** Structural results under offline and online shopping

Shopping	Hyp.	Structural Paths	Coeff. $\beta$	t-value	Test results
Offline	H1a	Design -> Arousal	0.116	0.826	ns
Online			0.100	0.752	ns
Offline	H1b	Layout -> Arousal	0.032	0.210	ns
Online			0.099	0.559	ns
Offline	H1c	Information -> Arousal	0.105	0.829	ns
Online			0.053	0.320	ns
Offline	H2a	Design -> Pleasure	0.060	0.593	ns
Online			0.007	0.083	ns
Offline	H2b	Layout -> Pleasure	0.048	0.417	ns

Online			0.172	1.479	ns
Offline	H2c	Information -> Pleasure	-0.058	0.485	ns
Online			-0.029	0.260	ns
Offline	H3	Arousal->Pleasure	0.635	7.374***	s
Online			0.687	7.358***	s
Offline	H4a	Arousal ->Delight	0.289	2.329**	s
Online			0.294	1.827*	s
Offline	H4b	Pleasure->Delight	0.128	0.957	ns
Online			0.257	1.575	ns
Offline	H5a	Arousal->Loyalty	0.015	0.095	ns
Online			0.182	1.034	ns
Offline	H5b	Delight->Loyalty	0.125	1.098	ns
Online			0.134	1.071	ns
Offline	H5c	Pleasure->Loyalty	0.170	1.042	ns
Online			0.066	0.381	ns
Offline	H6a	Arousal->Word-of-Mouth	-0.009	0.058	ns
Online			0.046	0.261	ns
Offline	H6b	Delight->Word-of-Mouth	0.113	1.028	ns
Online			0.175	1.569	ns
Offline	H6c	Pleasure->Word-of-Mouth	0.254	1.667*	s
Online			0.271	1.723*	s
R <sup>2</sup> Arousal Offline	0.045				
R <sup>2</sup> Arousal Online	0.048				
R <sup>2</sup> Pleasure Offline	0.421				
R <sup>2</sup> Pleasure Online	0.538				
R <sup>2</sup> Delight Offline	0.148				
R <sup>2</sup> Delight Online	0.261				
R <sup>2</sup> Word-of-Mouth Offline	0.090				
R <sup>2</sup> Word-of-Mouth Online	0.176				
R <sup>2</sup> Loyalty Offline	0.063				
R <sup>2</sup> Loyalty Online	0.104				
Average R <sup>2</sup> Offline	0.153				
Average R <sup>2</sup> Online	0.226				
GoF Offline	0.34				
GoF Online	0.42				
f <sup>2</sup> Offline	0.18				
f <sup>2</sup> Online	0.29				

\* t = 1.645 is significant at 0.050 or \*p<0.050; \*\* t = 1.96 is significant at 0.025 or \*\*p<0.025; \*\*\* t = 2.326 is significant at 0.010 or \*\*\*p<0.010.

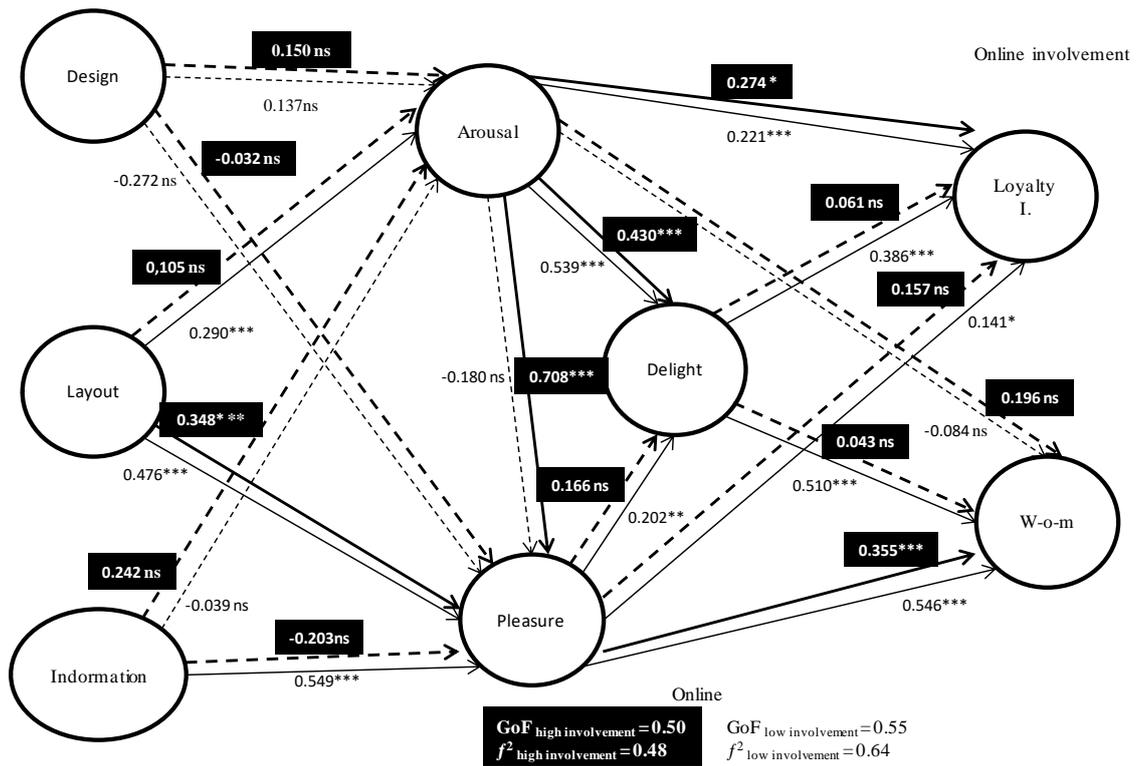
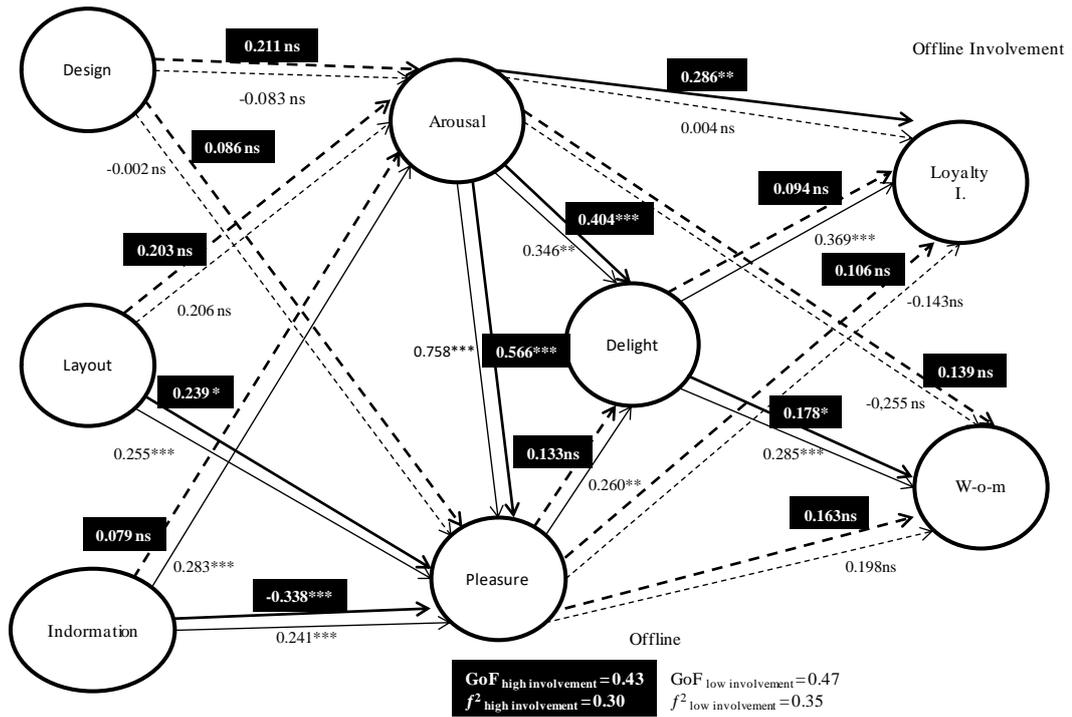
s- supported; ns- not supported.

To test H7 and H8, four different models were tested independently. Concerning GoF and  $f^2$  statistics, the values displayed in Figure 2 range from 0.55 to 0.43 for GoF and from 0.30 to 0.64 for  $f^2$ , which represent a large effect size. Figure 3 reveals GoF values that range from 0.39 to 0.47, a large sample size, and  $f^2$  values that range from 0.24 to 0.42, a medium to large sample size. Thus, these statistics demonstrate that the proposed research models have a good fit to the collected data sets.

The results for offline and online subsamples showing the moderating effect of age are presented in Figure 2. H7 proposed that the strength of the interrelationships among atmospheric factors, emotions, and future intentions will be different for consumers with high and low involvement in shopping. The results testing H7 show that

involvement partially moderates interrelationships among constructs proposed in the research model. Compared to the aggregate model, where all atmospheric factors have no impact on arousal and pleasure, there are several differences. First, under the offline environment, for highly involved people, (1) layout and information are significant predictors for pleasure; (2) arousal has a positive effect on pleasure, delight, and loyalty; and (3) delight has a positive effect on word-of-mouth. Other paths in the model are not significant. For consumers with low involvement, (1) layout has a positive influence on pleasure, whereas information positively influences both pleasure and delight; (2) arousal has a positive impact on pleasure and delight; and (3) delight positively influences both loyalty and word-of-mouth.

Second, under the online environment, different phenomena are observed. For people with high involvement, (1) layout is a significant predictor for pleasure; (2) arousal has a positive effect on pleasure and delight; and (3) pleasure has a positive impact on word-of-mouth. Other paths in the model are not significant. For consumers with low involvement, (1) layout has a positive effect on both arousal and pleasure, whereas information positively influences pleasure; (2) arousal has a positive impact on delight and loyalty; and (3) pleasure has a significant positive impact on both loyalty and word-of-mouth. No other path has effect.



Black and thick lines represent path coefficients found in the high involvement subsample  
 White and thin lines represent path coefficients found in the low involvement subsample.

\*\*\*p<0.010; \*\*p<0.025; \*p<0.050; ns: not significant.

Fig. 2. Structural results: high and low involvement in shopping

Hypothesis 8 proposed that the strength of interrelationships among atmospheric factors, emotions, and intentions are expected to be different for younger and older consumers. The results for moderating impact of offline and online environments are summarized in Figure 3. The results demonstrate that younger and older people respond differently, implying the partial moderating effect of age. First, different interrelationships among constructs under the offline environment are discussed. In the case of older consumers, (1) layout and information are a significant predictor for pleasure; (2) arousal has a positive effect on pleasure and delight; and (3) all other paths in the model are not significant. For younger consumers, (1) no atmospheric factor is significant; (2) arousal has a positive effect on pleasure and delight; (3) pleasure influences both loyalty and word-of-mouth; and (4) no other paths in the model are significant. Second, under the online environment, older and younger generations respond differently. In the case for older consumers, (1) layout is a significant predictor for pleasure; (2) arousal has a positive effect on pleasure and loyalty; and (3) pleasure has a positive effect on word-of-mouth. All other paths in the model are not significant. For young consumers, (1) design has a positive effect on arousal, whereas layout positively influences pleasure; (2) arousal has a positive impact on pleasure and delight; (3) pleasure has a positive influence on both delight and word-of-mouth; and (4) delight positively influences both loyalty and word-of-mouth.

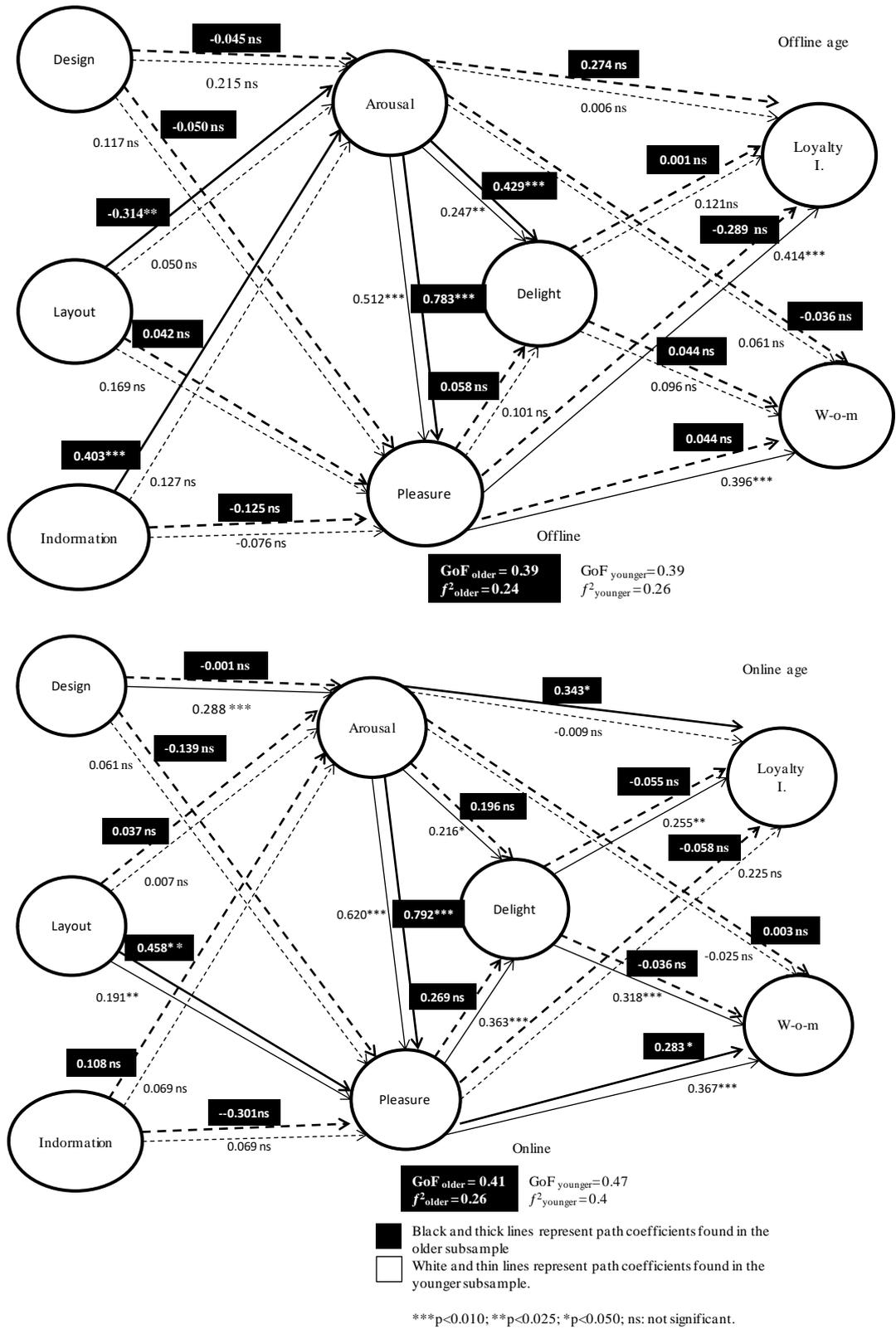


Fig. 3. Structural results: older and younger consumers

Table 5 and Table 6 show t-test results, which examine differences in path coefficients for both involvement and age, under offline and online environments.

**Table 5** Two group analysis for the moderating effect of involvement

Structural Paths	Offline					Online				
	$\beta_{\text{LowI}}-\beta_{\text{HighI}}$	SE <sub>LowI</sub>	SE <sub>HighI</sub>	T value	Test result	$\beta_{\text{LowI}}-\beta_{\text{HighI}}$	SE <sub>LowI</sub>	SE <sub>HighI</sub>	tvalue	Test result
Design -> Arousal	-0.295	0.126	0.129	-1.625	Nd	-0.013	0.248	0.096	-0.052	nd
Design-> Pleasure	-0.089	0.086	0.110	-0.621	Nd	-0.240	0.176	0.074	-1.342	nd
Layout -> Arousal	0.003	0.139	0.157	0.013	Nd	0.185	0.124	0.150	0.928	nd
Layout-> Pleasure	-0.494	0.099	0.145	-2.720***	D	0.128	0.105	0.148	0.685	nd
Information -> Arousal	0.184	0.095	0.126	1.136	Nd	-0.281	0.203	0.151	-1.136	nd
Information-> Pleasure	0.579	0.083	0.121	3.825***	D	0.752	0.091	0.140	4.329***	d
Arousal->Pleasure	0.192	0.048	0.087	1.851*	D	-0.887	0.145	0.073	-5.771***	d
Arousal->Delight	-0.058	0.170	0.132	-0.277	Nd	0.109	0.075	0.140	0.650	nd
Pleasure->Delight	0.127	0.133	0.146	0.637	Nd	0.037	0.102	0.177	0.172	nd
Arousal->Loyalty	-0.283	0.170	0.127	-1.360	Nd	-0.053	0.094	0.158	-0.274	nd
Arousal-> Word-of-Mouth	-0.394	0.184	0.127	-1.818	Nd	-0.280	0.063	0.176	-1.397	nd
Pleasure->Loyalty	-0.249	0.226	0.144	-0.962	Nd	-0.016	0.080	0.150	-0.091	nd
Pleasure->Word-of-Mouth	0.036	0.199	0.152	0.146	Nd	0.191	0.052	0.145	1.155	nd
Delight->Loyalty	0.275	0.077	0.104	2.064**	D	0.325	0.104	0.128	1.932*	d
Delight->Word-of-Mouth	0.108	0.093	0.106	0.754	Nd	0.467	0.090	0.141	2.690***	d
R <sup>2</sup> Arousal		0.140	0.198				0.133	0.202		
R <sup>2</sup> Pleasure		0.631	0.389				0.466	0.603		
R <sup>2</sup> Delight		0.325	0.243				0.334	0.320		
R <sup>2</sup> Word-of-Mouth		0.089	0.148				0.625	0.296		
R <sup>2</sup> Loyalty		0.102	0.170				0.333	0.196		
Average R <sup>2</sup>		<b>0.257</b>	<b>0.230</b>				<b>0.380</b>	<b>0.323</b>		
Sample size		104	124				104	124		

\*p<0.050; \*\*p<0.025 \*\*\*p<0.010; nd – not different; d – different.

**Table 6** Multi-group analysis for the moderating effect of age

Structural Paths	Offline					Online				
	$\beta_{\text{Younger}}-\beta_{\text{Older}}$	SE <sub>Younger</sub>	SE <sub>Older</sub>	tvalue	Test result	$\beta_{\text{Younger}}-\beta_{\text{Older}}$	SE <sub>Younger</sub>	SE <sub>Older</sub>	tvalue	Test result
Design -> Arousal	0.260	0.137	0.132	1.272	nd	0.289	0.107	0.184	1.465	nd
Design-> Pleasure	0.167	0.108	0.087	1.079	nd	0.200	0.081	0.118	1.453	nd
Layout -> Arousal	0.364	0.173	0.144	1.456	nd	-0.030	0.122	0.255	-0.119	nd
Layout-> Pleasure	0.127	0.140	0.081	0.660	nd	-0.267	0.089	0.234	-1.258	nd
Information -> Arousal	-0.277	0.110	0.128	-1.602	nd	0.030	0.112	0.214	0.136	nd
Information ->Pleasure	0.049	0.113	0.101	0.296	nd	0.370	0.085	0.193	2.013**	d
Arousal->Pleasure	-0.271	0.112	0.057	-1.785*	d	-0.172	0.079	0.066	-1.505	nd
Arousal ->Delight	-0.182	0.122	0.150	-0.931	nd	0.020	0.137	0.211	0.081	nd
Pleasure->Delight	0.043	0.130	0.141	0.217	nd	0.094	0.130	0.213	0.400	nd
Arousal->Loyalty	-0.268	0.137	0.186	-1.174	nd	-0.352	0.160	0.160	-1.459	nd
Arousal->Word-of-Mouth	0.097	0.144	0.200	0.403	nd	-0.028	0.149	0.185	-0.117	nd
Pleasure->Loyalty	0.703	0.115	0.168	3.562***	d	0.283	0.176	0.161	1.088	nd
Pleasure->Word-of-Mouth	0.301	0.116	0.206	1.381	nd	0.084	0.150	0.165	0.363	nd
Delight->Loyalty	0.120	0.110	0.136	0.681	nd	0.310	0.126	0.122	1.641	nd
Delight->Word-of-Mouth	0.052	0.113	0.130	0.291	nd	0.354	0.092	0.131	2.265**	d
R <sup>2</sup> Arousal		0.106	0.107				0.133	0.020		
R <sup>2</sup> Pleasure		0.375	0.587				0.562	0.664		
R <sup>2</sup> Delight		0.100	0.225				0.289	0.195		
R <sup>2</sup> W-o-M		0.219	0.009				0.336	0.074		
R <sup>2</sup> Loyalty		0.214	0.039				0.169	0.079		
Average R <sup>2</sup>		<b>0.203</b>	<b>0.194</b>				<b>0.298</b>	<b>0.207</b>		
Sample size		187	110				187	110		

\*p<0.050; \*\*p<0.025 \*\*\*p<0.010; nd – not different; d – different.

Several points are worthy of discussion. First, the results presented above expose similarities and differences in relation to those found in previous studies. Our hypotheses H1 and H2 proposed that atmospheric factors (design, layout, and information) exercise a positive effect on arousal (H1a, H1b, H1c) and on pleasure (H2a, H2b, H2c), in accordance to previous studies (e.g., Lin & Lu, 2000; Mummalaneni, 2005; Davis, Wang, & Lindridge, 2008; Ha & Stoel, 2009; Koo & Ju, 2010). However, globally the results of the current study do not support H1 or H2, for both offline and online environments. On the contrary, when we split the data regarding the moderate effect of involvement, layout and information exercise significant effect on arousal and pleasure in both offline and online contexts. Layout and information also influence arousal and pleasure when we split data based on age (younger and older consumers), except in case of younger consumers and offline context. The design factor only impacts significantly arousal in the online context and for younger consumers. Therefore, regarding the disaggregated data, hypotheses H1 and H2 are partially supported.

Second, the results reveal that three statistically significant relationships between atmospheric factors and emotions in the offline context have a negative sign, contrary to our expectations based on previous studies, especially those regarding the S-O-R model (e.g., Menon & Kahn, 1995; Eroglu et al., 2003; Koo & Ju, 2010). These three cases are: Layout->Pleasure for low involvement consumers; Information->Pleasure for high involvement consumers; and Layout->Arousal for older consumers. In fact, atmospheric cues are expected to affect consumers positively, giving them arousal and pleasure. However, this study shows that the same atmospheric cues can cause different impressions on consumers. The store layout, its potential attractiveness, and the range of products can cause a feeling of calm or not arousal for consumers over 50 years old, or

the same store layout can lead to feelings of displeasure or even annoyance for low involvement consumers. Likewise, the store information about products and forms of payment can be annoying for consumers with high involvement in shopping.

Third, the results globally support hypothesis H3, proving once more that arousal can play the role of activator of pleasure, as previous studies, such as Mano and Oliver, (1993), Sherman et al. (1997), and Oliver et al. (1997), have found. Similarly, arousal can lead to delight (H4a supported), and this relationship is stronger than the relationship between pleasure and delight, because globally hypothesis H4b is not supported. The direct and positive effect of arousal on pleasure and on delight corroborate the studies of Finn (2005) for retail web sites, and even the seminal work of Oliver et al. (1997) in the context of a symphony concert. Loureiro and Kastenholtz (2011) also found significant effects of both arousal and pleasure (positive affect) on delight in the rural tourism context. Nevertheless, the current study found support for the relationship between pleasure and delight in three circumstances: for low involvement consumer in both online and offline contexts and for younger consumers in the online context. So, for consumers with high involvement in shopping, the feeling of pleasure, happiness, or contentment seems to be not enough to lead to delight; for them, a mechanism of activation is fundamental for delight. In addition, older consumers tend to need more stimulation in order to be delighted. Moreover, the three mentioned cases are the only situations analyzed where delight (reinforced by arousal and pleasure) has a positive and significant influence on positive word-of-mouth and loyalty. These findings corroborate the previous studies of Finn (2005) and Loureiro and Kastenholtz (2011), and even Oliver et al. (1997).

Fourth, our study analyzed the emotional responses as proposed in the S–O–R model. Globally, only hypothesis H6c is supported, meaning that feelings of happiness

and pleasure are important to motivate consumers, both in the online and offline contexts, to speak well about the store, and to encourage other to visit the store. Concerning disaggregated data, arousal tends to exercise a significant and positive effect on loyalty intentions for low involvement consumers and older consumers. Consumers over 50 years old, as well as consumers with low involvement in shopping, need to feel aroused or wide awake to visit the offline or offline stores to buy products again. Thus, hypotheses H5 and H6 are only partially supported. Finally, contrary to previous studies (e.g., Menon & Kahn, 1995; Eroglu et al., 2003; Koo & Ju, 2010), this study regards the emotional response intentions as two different constructs—loyalty intentions and word-of-mouth—which can contribute to a better understanding of the impact of different emotions (arousal, pleasure, and delight) on behavioral intentions and attitudinal indicators, reflecting product advocacy.

Fifth, the results provided in the current study show the importance of disaggregated data analysis regarding the level of involvement in shopping and age difference, and even comparisons between online and offline perceptions, in order to capture the subtleties of consumer perceptions towards the same atmospheric cues. As mentioned before, the aggregated data do not reveal significant effects of atmospheric cues on emotions, but the disaggregated data show significant positives and negative impacts of atmospheric cues on emotions.

## **6. Conclusions**

The findings reveal that layout and information contain the most important atmospheric stimuli that lead to both arousal and pleasure. For consumers with low involvement in shopping, both in the offline and online contexts, layout and information stimulate positively their pleasure. Information is stronger than layout in stimulating low involvement consumers in the offline context, and the opposite occurs in the online

contexts. Thus, as expected, there are differences between low involvement consumers and high involvement consumers, the latter need to be more stimulated or at least need to have other types of stimuli.

Important atmospheric cues to stimulate and give pleasure to low involvement consumers include a layout where it is easy to get the desired products, a website or equipment and materials in a store that are visually appealing, together with sufficient and relevant information about products, and the existence of information about forms of payment. However, high involvement consumers do not feel pleasure with the information factors provided, especially in offline stores. These findings seem to contradict previous studies (e.g., Puccinelli et al., 2009); nevertheless, a possible explanation for such results could be the fact that consumers with high involvement in shopping tend to be well informed and actively seek information, so when they visit a store they go with a decision already made and they know what they really want.

Concerning age, globally, the stimuli analyzed in the current study do not exercise a strong effect on younger consumers, especially in the offline context. However, website design has a significant impact on arousal for younger consumers. They tend to be stimulated by the architecture, decoration, and colors of the websites.

Older consumers do not tend to be positively stimulated and excited by the layout of offline stores. Indeed, older consumers are more experienced and show higher emotional control and maturity (Lawton et al., 1992; Carstensen et al., 2000), so that the traditional architecture, decoration, and colors of offline stores do not have enough novelty and consequently do not contribute positively to excite them.

In the online context, the website layout (easy to get products, beautiful graphics/images) contributes positively and significantly to please consumers, both young and old. Therefore, the findings show that the way websites are built regarding

aesthetics and presentation of the products is a critical point to provide happiness and pleasure to consumers.

Globally, the established interrelationships among arousal, pleasure, and delight, as proposed in the present study, are supported, and there are no significant differences mediated by involvement or age, except for the relationship between arousal and pleasure, which is stronger for younger consumers than for older consumers in the online context. Indeed, young consumers are emotionally more unstable, and pleasure tends to be more intense for them as a result of an aroused state. For younger consumers, as we discussed before, it is essentially the website design that leads to arousal. Thus, in line with Mano and Oliver (1993) and Oliver et al. (1997), for both offline and online contexts, delight is proved to be a second order emotion as a function of arousal and pleasure. Arousal plays a role in activation of pleasure.

The effect of emotions on future intentions is globally proved, as expected. The effect of delight on loyalty intentions is significantly higher for the low involvement consumer in offline stores than for the high involvement consumer. The influence of delight on word-of-mouth is significantly higher for the low involvement consumer, as well as for the younger consumer, than for the high involvement consumer, as well as for the older consumer, in the online context. An explanation could lie in the fact that low involvement and younger consumers need to achieve a higher order emotion to say positive things about the website to others. In the present study as in previous studies (e.g., Oliver et al., 1997; Loureiro & Kastenholz, 2011), in certain situations delight exercises a significant effect on future intentions; in other situations, it does not. Thus, low involvement consumers and younger consumers are more suitable to re-use the website, or even to re-visit the store and engage in positive word-of-mouth than are high involvement consumers and older consumers.

### ***6.1. Contributions and implications***

The present study presents important implications for research and practice. Based on the literature review and observations of atmospheric cues in offline stores and websites of hedonic and utilitarian brands (such as car retailers, supermarkets, travel agencies, and clothing stores), we built a set of items grouped into three factors: design, layout, and information. These atmospheric factors applied to online and offline contexts. We also contributed to the research by introducing a second order emotion, delight, as a function of more tradition emotions in the research field associated with the application of the S-O-R model. The moderators of involvement in shopping and age reveal their importance and relevance.

The findings provide important implications for stores and website practitioners. Globally, layout and information play a critical role in promoting the positive emotions (arousal, pleasure, and delight) of consumers. However, in the particular case of younger consumer, the website design is the most important stimulus to get them aroused. Consumers with high involvement in shopping do not appreciate traditional information about forms of payment and products in offline stores. Younger consumers are more enthusiastic about the atmospheric factors in the online context than in the offline context. Finally, high involvement consumers and younger consumers need to be more stimulated than low involvement consumers and older consumer. Therefore, practitioners need to be aware of such differences and be more careful in providing atmospheric cues to their target consumers.

### ***6.2. Limitations and further research issues***

The current study has some limitations, which can be an inspiration for future research avenues. The study took place in a European context in a Latin country with stores and websites associated with European brands, so it should be replicated in other

countries and cultural contexts. We examined three atmospheric factors in order to compare offline and online environments, but in the future other atmospheric cues should be taken into account. For example, the sound stimulus was not used because we observed that the websites most visited by the participants did not have such stimulus. In addition, more studies focused on old consumers should be done, splitting the sample into different age groups and different skills in using websites.

- [1] J. Baker, D. Grewal, A. Parasuraman, The Influence of Store Environment on Quality Inferences and Store Image, *J. Acad. Mark. Sci.* 22 (1994) 328-339.
- [2] J. Baker, M. Levy, D. Grewal, An Experimental Approach to Making Retail Store Environmental Decisions, *J. Retail.* 68 (1992) 445-460.
- [3] M. J. Bitner, Servicescapes: The Impact of Physical Surroundings on Customers and Employees, *J. Mark.* 56 (1992) 57-71.
- [4] L. Dailey, Navigational Web Atmospherics Explaining the Influence of Restrictive Navigation Cues, *J. Bus. Res.* 57 (2004) 795-803.
- [5] E. G. Carmines, R. A. Zeller, *Reliability and Validity Assessment*, London: Ed. Sage Publications, Inc., 1979
- [6] W. W. Chin, The Partial Least Squares Approach to Structural Equation Modeling, in: G. A. Marcoulides (Eds.), *Modern Methods for Business Research*, Lawrence Erlbaum Associates Publisher, New Jersey, 1998, pp. 295-336.
- [7] W. W. Chin, B. L. Marcolin, P. R. Newsted, A partial least squares latent variable modelling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic mail emotion/adoption study, *Inform. Syst. Res.* 14 (2003) 189-217.
- [8] L.L. Carstensen, U. Mayr, M. Pasupathi, J.R. Nesselroade, Emotional experience in everyday life across the adult life span, *J. Pers. Soc. Psychol.* 79 (2000) 644–655.
- [9] L. Davis, S. Wang, A. Lindridge, Culture Influences on Emotional Responses to On-line Store Atmospheric Cues, *J. Bus. Res.* 61 (2008) 806-812.
- [10] R. J. Donovan, J. R. Rossiter, Store Atmosphere: An Environmental Psychology Approach, *J. Retail.* 58 (1982) 34-57.
- [11] R. J. Donovan, J. R. Rossiter, G. Marcoolyn, A. Nesdale, ). Store Atmosphere and Purchasing Behavior, *J. Retail.* 70 (1994) 283-294.
- [12] S. A. Eroglu, K. A. Machleit, L. M. Davis, Atmospheric Qualities of Online Retailing a Conceptual Model and Implications, *J. Bus. Res.* 54 (2001) 177-184.

- [13] S. A. Eroglu, K. A. Machleit, L. M. Davis, Empirical Testing of a Model of Online Store Atmospherics and Shopper Responses, *Psychol. Mark.* 20 (2003) 139-150.
- [14] A. Finn, Reassessing the foundations of customer delight, *J. Serv. Res-us.* 8 (2005) 103-116.
- [15] C. Fornell, F.L. Bookstein, Two structural equation models: LISREL and PLS applied to consumer exit-voice theory, *J. Mark. Res.* 19 (1982) 440–452.
- [16] C. Fornell, D. F. Larcker, Evaluating structural models with unobservables variables and measurement error, *J. Mark. Res.* 28 (1981) 39-50.
- [17] S. Ha, L. Stoel, Consumer e-shopping acceptance. Antecedents in a technology acceptance model, *J. Bus. Res.* 62 (2009) 565–571.
- [18] A. V. Hausman, J. S. Siekpe, The Effect of Web Interface Features on Consumer Online Purchase Intentions, *J. Bus. Res.* 62 (2009) 5-13.
- [19] J. Hulland, Use of partial least squares (PLS) in strategic management research: A review of four recent studies, *Strateg. Manage. J.* 20 (1999) 195-204.
- [20] V. D. Kaltcheva, B. A. Weitz, When Should a Retailer Create an Exciting Store Environment, *J. Mark.* 70 (2006) 107-118.
- [21] D. M. Koo, J. Lee, Inter-relationships among dominance, energetic and tense arousal, and pleasure, and differences in their impacts under online vs. offline environment, *Comput. Hum. Behav.* 27 (2011) 1740-1750.
- [22] D. M. Koo, S.H. Ju, The interactional effects of atmospherics and perceptual curiosity on emotions and online shopping intention, *Comput. Hum. Behav.* 26 (2010) 377-388.
- [23] P. Kotler, Atmospherics as a marketing tool, *J. Retail.* 49 (1973-74) 48-64.
- [24] A. Kumar, R.W. Olshavsky, M. F. King, Exploring Alternative Antecedents of Customer Delight, *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior j.c.s./d. & c.b..* 14 (2001) 14-26.
- [25] M.P. Lawton, M.H. Kleban, D. Rajagopal, J. Dean, Dimensions of affective experience in three age groups, *Psychol. Aging.* 7 (1992) 171–184.
- [26] J. C-C. Lin, H. Lu, Towards an understanding of the behavioral intention to use a web site, *Int. J. Inform. Manage.* 20 (2000) 197–208.
- [27] J.B. Lohmoller, The PLS program system: Latent variables path analysis with partial least squares estimation, *Multivar. Behav. Res.* 23 (1989) 125–127.
- [28] S. Loureiro, E. Kastenholtz, Corporate reputation, satisfaction, delight, and loyalty towards rural lodging units, *Int. J. Hosp. Manag.* 30 (2011) 575–583.
- [29] E. E. Manganari, G. J. Siomkos, A. P. Vrechopoulos, Store Atmosphere in Web Retailing, *Eur. J. Marketing.* 43 (2009) 1140-1153.

- [30] H. Mano, R.L. Oliver, Assessing the Dimensionality and Structure of Consumption Experience: Evaluation, Feeling, and Satisfaction, *J. Consum. Res.* 20 (1993) 451-466.
- [31] L. N. McKinney, Creating a Satisfying Internet Shopping Experience Via Atmospheric Variables, *International Journal of Consumer Studies Int. J. Consum. Stud.*, 28 (2004) 268-283.
- [32] A. Mehrabian, J. A. Russell, *An approach to environmental psychology*, MA: MIT Press, Cambridge, 1974.
- [33] S. Menon, B. E. Kahn, The impact of context on variety seeking in product choices, *J. Consum. Res.* 22 (1995) 285–295.
- [34] S. Menon, B. Kahn, Cross-category Effects of Induced Arousal and Pleasure on the Internet Shopping Experience. *J. Retail.* 78 (2002) 31-40.
- [35] R. E. Milliman, D. L. Fugate, Atmospheric as an Emerging Influence in the Design of Exchange Environments, *Journal of Marketing Management J. Mark Manage.* 3 (1993) 66-74.
- [36] J. C. Mowen, M. S. Minor, *Consumer Behavior: A Framework*, first ed., Upper Saddle River, New Jersey: Prentice Hall, 2001.
- [37] V. Mummalaneni, An Empirical Investigation of Web Site Characteristics, Consumer Emotional States and On-line Shopping Behaviors. *J. Bus. Res.* 58 (2005) 526-532.
- [38] T. P. Novak, D. L. Hoffman, Y.-F. Yung, Measuring the Customer Experience in Online Environments: A Structural Modeling Approach, *Mark. Sci.* 19 (2000) 22-42.
- [39] J.C. Nunnally, *Psychometric Theory*, second ed., New York: McGraw-Hill, 1978.
- [40] R. L. Oliver, R. T. Rust, S. Varki, Customer delight: foundations, findings and managerial insight, *J. Retail.* 73 (1997) 311-336.
- [41] K. Patterson, Delighted clients are loyal clients, *Rough Notes.* 140 (1997) 221-34.
- [42] R. Plutchik, A general psychoevolutionary theory of emotion, in: R. Plutchik, H. Kellerman (Eds.), *Emotion: theory, research and experience*, Theories of emotion, Academic Press, New York, 1980, pp. 3-33..
- [43] N. M. Puccinelli, R. C. Goodstein, D. Grewal, R. Price, P. Raghurir, D. Stewart, Customer Experience Management in Retailing: Understanding the Buying Process, *J. Retail.* 85 (2009) 15-30.
- [44] M. L. Richins, Measuring Emotions in the Consumption Experience, *J. Consum. Res.* 24 (1997) 127-146.
- [45] C.M. Ringle, S. Wende, A. Will, SmartPLS 2.0 (beta), available at: [www.smartpls.de](http://www.smartpls.de), Hamburg (2005).
- Ringle C.M., Wende, S., and Will, A. (2005), “SmartPLS 2.0 (beta)”, available at: [www.smartpls.de](http://www.smartpls.de), Hamburg.

- [46] S.D. Roberts, N. Zhou, The 50s and older characters in the advertisements of modern maturity: growing older, getting better, *J. Appl. Gerontol.* 16 (1997) 208-217.
- [47] J. A. Russell, A circumplex model of affect, *J. Pers. Soc. Psychol.* 39 (1980) 1161-1178.
- [48] N. Selwyn, S. Gorard, J. Furlong, L. Madden, Older adults' use of information and communications technology in everyday life, *Ageing Soc.* 23 (2003) 561–582.
- [49] S. Sharma, R. M. Durand, O. Gur-Arie, Identification and analysis of moderator variables, *J. Mark. Res.* 18 (1981) 291–300.
- [50] E. Sherman, A. Mathur, R. B. Smith, Store Environment and Consumer Purchase Behavior: Mediating Role of Consumer Emotions, *Psychol. Mark.* 14 (1997) 361-378.
- [51] K. Spies, F. Hesse, K. Loesch, Store Atmosphere, Mood and Purchasing Behavior, *Journal of Research in Marketing int.j.res. mark* 14 (1997) 1-17.
- [52] I. Szmigin, M. Carrigan, Learning to love the older consumer, *Journal of Consumer Behaviour j. consum.behav. .* 1 (2001) 22-34.
- [53] M. Tenenhaus, V. E. Vinzi, Y.-M. Chatelin, C. Lauro, PLS Path Modeling, *Comput. Stat.Data An.* 48 (2005) 159-205.
- [54] D. C. Thang, B. L. Tan, Linking Consumer Perception to Preference of Retail Stores: An Empirical Assessment of Multiple-Attributes of Store Image, *Journal of Retailing and Consumer Services j.retailing consum serv.* 10 (2003) 193-200.
- [55] L. W. Turley, R. E. Milliman, Atmospheric Effects on Shopping Behavior: A Review of the Experimental Evidence, *J. Bus. Res.* 49 (2000) 193-211.
- [56] A. P. Vrechopoulos, Virtual Store Atmosphere in Internet Retailing: Measuring Virtual Retail Store Effects on Consumer Buying Behaviour. A thesis submitted for the degree of Doctor of Philosophy (2001).
- [57] A. P. Vrechopoulos, G. J. Siomkos, Virtual Store Atmosphere in Non-Store Retailing, *Journal of Internet Marketing. J. Internet market* (2002) 1-6.
- [58] K. L. Wakefield, J. Baker, Excitement at the Mall: Determinants and Effects on Shopping Response, *J. Retail.* 74 (1998) 515-539.
- [59] K. L. Wakefield, J. G. Blodgett, The Importance of Servicescapes in Leisure Service Settings, *J. Serv. Mark.* 8 (1994) 66-76.
- [60] D. Watson, A. Tellegen, Toward a consensual structure of mood, *Psychol. Bull.* 98 (1985) 219-235.
- [61] M. Wetzels, G. Odekerken-Schröder, C. van Oppen, Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration, *MIS Quart.* 33 (2009) 177–195.
- [62] H. Wold, Partial least squares, in: S. Kotz, N. L. Johnson, (Eds.), *Encyclopedia of statistical science*, Wiley, New York, 1985, pp. 581–591.

- [63] C.-S. Wu, F.-F. Cheng, D. C. Yen, The Atmospheric Factors of Online Storefront Environment Design: An Empirical Experiment in Taiwan, *Inform. Manage.* 45 (2008) 493-498.
- [64] Zaichkowsky, Measuring the involvement construct. *J. Consum. Res.* 12 (1985) 341-352.
- [65] V. Zeithaml, L. Berry, A. Parasuraman, The Behavioural Consequences of Service Quality, *J. Mark.* 60 (1996) 31-46.
- [66] Y. Zhang, Age, Gender, and Internet attitudes among employees in the business world, *Comput. Hum. Behav.* 21 (2005) 1-10.