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The effects of store atmosphere on shopping behaviour - A literature review

This paper provides an insight into how the atmospherics of a retail environment influence shopping behaviour. Its objective is to support researchers and practitioners by summarizing the current state of knowledge and identifying gaps and avenues for future research. The scope covers studies in retail marketing and environmental psychology published during the last 35 years. It has been shown that environmental cues (music, scent etc.) have an effect on the emotional state of the consumer, which in turn causes behavioural changes, both positive (approach, buy more, stay longer etc.) and negative (not approach, buy less, leave earlier etc.). Most studies make reference to the PAD model, which proposes that the relevant emotions in this process can be measured along three dimensions Pleasure, Arousal and Dominance (Mehrabian, A. & Russell, J.A.,1974, An approach to environmental psychology, Cambridge, MA.: MIT Press). Since then, significant advances have been made to understand the effect of individual cues, their interaction, as well as the role of moderators, such as gender, age, or shopping motivation. However, there are a number of opportunities for further research. Too little is known about the moderating effects of Arousal and Dominance and how they interact with each other and with Pleasure dimension. Also a number of other moderators, such as gender and culture, should be integrated into the model.

1. Introduction

The buying process in a retail environment is triggered when consumers recognise that they have an unsatisfied need. Especially when shopping for fun, the decision to enter a particular store, how much time to spend inside, and to buy or not to buy is heavily influenced by the shopping environment and its effect on customers' emotions. Consequently, a retailers design their shops so that customers are attracted, locate merchandise easily, motivate unplanned purchases, and offer a satisfying shopping experience (Levy & Weitz 2009). A study found that 87% of Hungarian retailers consider the styles, colours and size of their shop an important part of tactical marketing (Józsa, Bátor & Sassné Grósz 1999). Understanding the effects of the shopping environment is therefore of great importance.

The influence of environmental cues on consumer behaviour has been widely discussed in the scientific literature, since Donovan and Rossiter (1982) introduced the concept of environmental psychology to marketing research. Their basic model assumes a Stimulus-Organism-Response taxonomy, where the environment (stimulus) has an impact on the emotional states of consumers along three dimensions, *pleasure*, *arousal* or *dominance* (organism). These act as mediators on the response, which is a behaviour characterised as *avoiding* or *approaching* (Mehrabian & Russell 1974, Woodworth 1928).

The model has been widely applied by the English speaking research community (Turley & Milliman 2000) but has also been translated for use in Hungary (e.g., Törőcsik 1995), Germany (e.g., Bost 1987) and Austria (e.g., Meixner 1999), for example. A significant effort has been made to understand which specific environmental cues need to be modified in a store (e.g., lightning, scent, music etc.) in order to increase sales, extend the time spend in the store or other approach behaviours. The servicescape literature has stressed that both customers and employees are an important part of the environment, and the model has been extended to include the effects of atmospherics on people, whose behaviour in turn has an effect on other people (Bitner 1990).

The objective of this text is to summarise what we know about environmental psychology in relation to consumer behaviour in a brick-and-mortar retail environment. Gaps are identified and a possible avenue for further research suggested. It's based on a review of studies published in books, scientific journals and working papers. As such, it is intended as an introduction as well as a source of information for researchers and practitioners alike and wishes to stimulate further studies in this fascinating field.

2. Current Body of Knowledge

As the most recent full literature review of the field of environmental psychology and retail was published by the Journal of Business Research over 10 years ago (Turley & Milliman 2000), it seems an appropriate time to conduct a new review.

The structure of this section follows the logic of the Mehrabian-Russel model, which has emerged as the dominant concept of explaining atmospherics effects on emotions and behaviour (Havlena & Holbrook 1986). Firstly, the model is introduced, as well as some subsequent extensions. Then, section 0 discusses a number of environmental stimuli and their effects on emotional states and behaviour (Baker 1987, Turley & Milliman 2000). Researchers have given somewhat less attention to the role of moderators. Some studies discuss the effect of shoppers' personal traits (e.g., gender, see Inman, Winer & Ferraro 2009), situational factors (e.g., sensation seeking behaviour, see Grossbart et al. 1975) and motivational aspects (e.g., hedonic vs. utilitarian shopping goals, see Babin, Darden & Griffin 1994), and they are summarised in section 0. Next, the three main emotional states pleasure, arousal and dominance are being described and related studies introduced in section 0. Lastly, many studies suggested the response by consumers/employees to be *approach* or *avoid*, but some have measured alternative dependent variables (see section 0).

2.1 Models of Environmental Psychology

The notion that store atmosphere influences consumer behaviour was introduced to marketing research by Kotler, who initially defined atmosphere to be a component of store image along with other variables, such as brightness and crowding (Kotler 1973). However, most research on store atmosphere today builds on the Mehrabian-Russel model, which is at the heart of a research stream called 'environmental psychology' and was first applied to retail settings by Donovan & Rossiter (1982). Environmental psychology is concerned with "(1) the direct impact of physical stimuli on human emotions and (2) the effect of the physical

stimuli on a variety of behaviours, such as work performance or social interaction" (Mehrabian & Russell, 1974, p.4).

Environmental psychologists apply a Stimulus-Organism-Response (S-O-R) paradigm (Woodworth 1928) which involves a stimulus taxonomy (e.g., environmental cues), a set of intervening or mediating variables (e.g., the level of arousal caused) and a taxonomy of responses (e.g., patronising a store) (Mehrabian & Russell 1974). In a consumer environment, the large number of individual atmospheric effects makes identifying and influencing these individually a complex undertaking. Mehrabian-Russell therefore proposed a general measure of atmospherics, the information rate, or *load* of an environment, which they assume causes a certain level of arousal. Load is defined as 1.) how well an individual knows and environment and can predict what will happen (amount of environmental novelty) and 2.) the number of elements, features and changes in an environment (complexity, Mehrabian 1976). A high load environment is novel, surprising, crowded and is assumed to stimulate and alert a person (Donovan & Rossiter 1982).

Mehrabian also noted that personality traits of the individual need to be considered, a notion which has been ignored by the large majority of studies to date. He suggests that a consumer's response will be mediated by the individual's ability to select among incoming stimuli. The model assumes that the environment influences a person's emotional state, which can be described along three orthogonal dimensions Pleasure-Displeasure, Arousal-Nonarousal and Dominance-Submissiveness (the PAD model). *Pleasure* indicates the degree to which a person is happy, pleased, satisfied, contented, hopeful, and/or relaxed. A person would score high on the *Arousal* construct if he/she is frenzied, jittery, aroused, stimulated or excited. *Dominance* refers to the extent to which a person feels in control of the situation and is able to act freely in the environment (Donovan et al. 1994).

Two of the emotional states, namely pleasure and arousal, appear to interact with each other. With a pleasure of close to zero (neutral), a moderate arousal causes a positive response and very high or low levels of arousal cause a negative response in the S-O-R taxonomy. However in an unpleasant environment (negative pleasure), the higher the arousal, the more negative the response (Mehrabian & Russell 1974).

The three emotional states determine and mediate the environment's effect onto the response which can be either approach or avoidance type behaviours. For example, consumers responding positively will want to spend more time in the environment, want to look around and interact with other individuals present. It will lead to enhanced performance or satisfaction (Mehrabian & Russell 1974).

The model has been supported by both empirical evidence and physiological reasoning and was applied widely since then (Mehrabian & Russell 1974, Donovan & Rossiter 1982, Gardner 1985, Donovan et al. 1994, Koo & J.-H. Lee 2011).

A wider perspective towards modelling store patronage was suggested by Monroe and Guiltinan (1975). Store patronage is largely determined by purchase needs and purchase habits, but then influenced subconsciously by the consumers perceived retail store types and characteristics.

These are filtered through attitudes before a patronage decision is made (Monroe & Guiltinan 1975). This approach is similar in the sense that the signals sent by a store's environment to consumers while in the store influence purchasing decisions. However a valuable extension is the circular nature of the Monroe-Guiltinan model, which means that shopping experiences shape the customer's habits and attitudes, as well as the store's image, which in turn influence future patronage decisions and loyalty (see also Kenesei 2002).

An important extension was offered by Bitner (1990) who notes that in service industries, the built environment (which she coined 'servicescape') affects not only customers but also employees as both "interact with each other within the organisation's physical facility" (Bitner 1992, p.85, see Figure 1 alább). Firstly, she states that the effect of perceived environmental cues on the organism is being moderated by personal as well as situational factors. In addition to personality traits (e.g. screening behaviour) as suggested in the PAD, also expectations, mood states of individuals entering an environment and so on are influencing the impact of servicescapes on internal responses. While mood states are a personal feature, they have been shown to be affected by the environment itself; as a highly arousing atmosphere will affect a person in an anxious and fatigued state differently than a relaxed and awake individual (Gardner 1985). People who are time sensitive will be more affected by crowding in a store then those who are more patient (Harrell & Hutt 1976).

Model of Store Atmospherics Effect on Consumer and Employee Behaviour

Figure 1
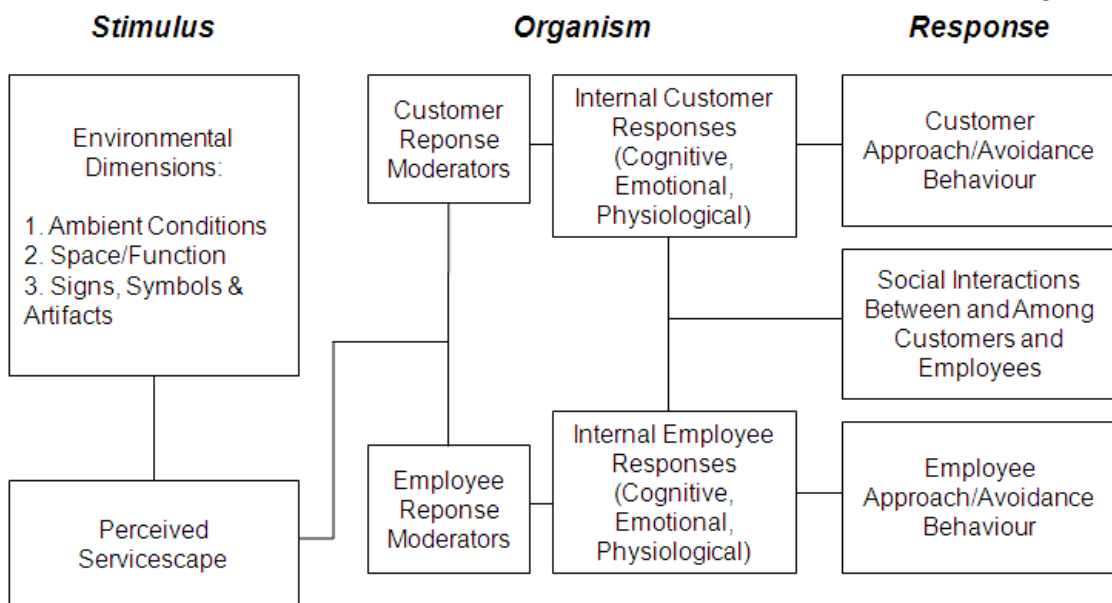
Source: based on Mehrabian & Russell (1974), Bitner (1992)

Secondly, internal responses lead to approach/arousal behaviour in employees as well as customers. For example a servicescape could be designed to encourage sales personnel to approach customers. Thirdly, the internal responses by individuals also affect the social interactions between and among customers and employees, which are an integral part of the service encounter (Bitner 1992).

2.2   Store Atmospherics

One early definition of store atmospherics calls them "buying environments [designed] to produce specific emotional effects in the buyer that enhance his purchase probability" (Kotler, 1973, p.50). Although increasing sales may be the prime objective of most store designs, research studies typically group possible reactions into two forms of behaviour – approach or avoid the store. In fact, avoidance (*not* to stay explore, affiliate or work) (Mehrabian & Russell 1974) may actually be a valid objective in some instances, as one may want to avoid under aged from entering a Casino or make restaurant patrons leave their table as soon as possible to allow new customers taking their seats (d' Astous 2000).

Among the service marketing literature, the surroundings in which service encounters take place have been coined 'servicescapes' in the early 1990's . Servicescapes are "all of the objective physical factors that can be controlled by the firm to enhance (or constrain) employee and customer actions" (Bitner 1992, p.65). This definition adds the important notion, that atmospherics affect employees as well as customers (Baker, Levy & Grewal 1992).
A somewhat broader definition suggests they are "consciously designed places, calculated to produce commercially significant actions" (Arnould, Price & Tierney 1998, p. 90). While the scope in terms of objectives is wider, this approach assumes that enterprises are actually able to influence all elements of the servicescape, or at least limits atmospherics to those cues which are being deliberately designed. However there can be no doubt that environments affect consumers regardless of the fact if they were consciously designed or not.

Based on the previous and limiting our analysis to retail environments, this paper will define *store atmospherics* to be all of the objective physical factors of a retail environment that can be controlled by the firm to enhance (or constrain) employee and customer actions. The term *servicescape* will be used synonymous to *store atmospherics.*

The original application of the M-R model suggests using the *load* of an environment as a general measure of the environment, which entails the degree of novelty and complexity (Mehrabian & Russell 1974). Some research has studied the overall impact of the environment on the level of pleasure and arousal without environmental measure (Donovan & Rossiter 1982). Later, Donovan et al have tested a 14 item scale measuring information rate. A factor analysis yielded five factors with eigenvalues greater than 1.0, of which two were deemed to be unreliable, suggesting that the stimulation measure *load* is not a good predictor. They content that "more practically, retailers need a taxonomy that applied to manipulative in-store factors" (Donovan et al. 1994 p. 55).

Since Kotler (1973) introduced the term atmospherics to the marketing literature, a fair number of publications have discussed the environmental cues influencing consumers in a shopping environment. Studies have influenced various stimuli including colour, music and scent in order to measure their effect on shopping behaviour. Although it has been suggested, that the importance of individual components of the servicescape is likely to vary between individual organisations (Bitner 1992), several authors have suggested universal categories (Baker 1987, Berman & Evans 1995, Turley & Milliman 2000).

Baker (1987) identified environmental cues in a store to be either Ambient Factors, Design Factors, or Social Factors (see Table 1). Based on her view, ambient factors, such as music, scent or air quality do not motivate purchase decisions when they are simply meeting customer expectations. Also an extreme ambient factor, such as very high or very low temperature can lead to avoidance behaviour. There could be exceptions, however, when extreme levels may have an impact on consumer behaviour, for example the scent of fresh bread attracting customers to a bakery (Baker 1987). She defines design factors to be either aesthetic or functional: Aesthetic factors are physical cues which customers observe (colour, architecture, style, materials etc.) and influence the level of pleasure in the service experience (Aubert-Gamet 1997). Functional factors facilitate the behaviour of customers in the servicescape and include layout, signage and comfort (Baker 1987). Social Factors include the influence by human presence in the servicescape, which was not completely integrated in the early studies in environmental psychology (Baker, Levy & Grewal 1992). The service personnel present in a customer environment, it's size, appearance, and behaviour, has been shown to impact on consumer behaviour (Baker, Levy & Grewal 1992, Bitner 1990, Turley & Milliman 2000). Furthermore, the appearance, behaviour and number of other customers are a crucial human facet of the environment (see for example studies on how crowding influences purchase intentions by Eroglu & Machleit, 1990; Machleit, Kellaris, & Eroglu, 1994).

Components of the Physical Store Environment   Table 1

Ambient Factors	Background conditions that exist below the level of our immediate awareness	Air Quality - Temperature - Humidity - Circulation/Ventilation Noise (Level/Pitch) Scent Cleanliness
Design Factors	Stimuli that exist at the forefront of our awareness	**Aesthetic** Architecture Colour Style Materials Décor Scale Shape Texture, Pattern **Functional** Layout Comfort Signage Accessories
Social Factors	People in the Environment	**Audience (Other Customers)** Number, Appearance, Behaviour **Service Personnel** Number, Appearance, Behaviour

Source: Based on Baker, 1987, p 80

The typology presented in Table 1 contains a number of limitations. Baker's focus on environmental effects on first time customers should be expanded to include all customers. Experienced customers may deliberately chose/avoid a store due to Ambient Factors, such as a certain music being played, or noise levels.

Furthermore, Ambient and Design Factors can be both external and internal. When considering retail outlets in malls or shopping streets, this differentiation is important, as the environmental effect occurs at different stages of the customer approaching a store. Also, internal factors may be easier to influence then external factors. The Human Factors fail to include the customer itself although customers can create new meaning or add new functions to the servicescape by his/her behaviour, presence and exterior (Aubert-Gamet 1997).

Proposing an alternative, Berman and Evans presented a larger number of atmospheric variables which is more appropriate for the purpose of this article (Berman & Evans 1995, see Table 2). They propose a separate category covering External Variables, including building characteristics, surrounding stores, address and location, congestion and traffic etc. Also, a greater level of detail is offered, which will prove helpful to identify possible gaps in the literature. The remainder of the section follows this structure, augmented by a fifth category covering Human variables as proposed by Turley and Milliman (2000).

2.2.1   External Variables

The number of research into effects of external variables is limited. We found only one study looking at the impact of environmental attributes of a larger area around a store (a shopping district) on shopper behaviour. While customers were shown to form perceptions of large complex macro environments, this varied greatly depending on shopper typology (Grossbart et al. 1975). An objective measure of the effect of window display design on sales has been developed (Edwards & Shackley 1992). Mixed support has been found for the hypothesis that the facilities in which physician meet their patients impact customer attitudes toward care received and customer satisfaction (Pinto & Leonidas 1994). More recent research into a consumer's decision to enter the store based on information received from window displays suggests that product category related information has a stronger effect on purchase decisions then store-related information. Also pre-knowledge of the customer about the product category have a mediating effect on shopping decisions: Consumers with medium knowledge of clothing are more influenced by window displays then those with low or high knowledge (Sen, Block & Chandran 2002).

One study included external variables as items in a general measure of store atmosphere (access, parking, exterior of building, landscaping of garden, outdoor exhibition area), however failed to present evidence for a relationship between atmosphere and purchasing behaviour (Pan, Su & Chiang 2008). The type of storefront display used was shown to have a 'spillover' effect onto the store image. Innovative displays (such as column stands, standing flags) have led to consumers perceiving a store to be more 'sophisticated', 'modern', and 'trendy' (Cornelius, Natter & Faure 2010).

Atmospheric Variables   Table 2

1. External Variables

Size of building Exterior walls
Surrounding area   Surrounding stores
Exterior display windows
Parking availability   Congestion and traffic
Entrances   Lawns and gardens
Color of building   Architectural style
Exterior signs Height of building
Address and location

2. General interior variables

Merchandise
Paint and wall paper Width of aisles
Lighting Colour schemes Scents
Ceiling composition Flooring and carpeting
P.A.   Wall composition
Tobacco smoke Temperature
usage Cleanliness   Music

3. Layout and design variables

Waiting queues
Placement of merchandise
Placement of equipment   Department locations
Placement of cash registers
Dead areas
Space design and allocation
Grouping of merchandise   Traffic flow
Waiting rooms   Work station placement
Waiting areas Furniture
Racks and cases

4. Point-of-purchase and decoration variables

Artwork   Signs and cards
Usage instructions
Wall decorations
Point-of-purchase displays   Teletext
Degrees and certificates
Product displays   Pictures
Price displays

5. Human variables

Crowding   Privacy
Employee characteristics
Customer characteristics
Employee uniforms

Based on Turley & Milliman (2000), p.194[1]

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[1] For a more efficient use of space, variables are displayed in tag clouds, created using www.wordle.net.

2.2.2 General Interior Variables

Colour schemes applied in elements of the interior design of environments have been shown to have an effect on shopping behaviour (Ellis & Ficek 2001, Babin, Hardesty & Suter 2003, Chebat & Morrin 2007). Shoppers can be more attracted to a retail display (Bellizzi, Crowley & Hasty 1983), are more likely to purchase, be aroused, have a different image of store and merchandise or spend more time in the environment (Bellizzi & Hite 1992), depending on the colours applied.
While some studies showed that lightning factors can influence both store image, examination and handling of merchandise (Baker, Levy & Grewal 1992, Summers & Hebert 2001), others found no significant effect (Areni & D. Kim 1994).

Music in a shopping environment has attracted much attention (Milliman 1982, Milliman 1986, Yalch & Spangenberg 1988, Yalch & Spangenberg 1990, Baker, Levy & Grewal 1992, Hui, Dubé & Chebat 1997, Yalch & Spangenberg 2000, Mattila & Wirtz 2001, Garlin & Owen 2006, Morin, Dubé & Chebat 2007, Broekemier, Marquardt & Gentry 2008). The studies show that music has an impact on sales, time spent in the environment (both perceived and actual), and the state of arousal. The extend of the effect depends on the type of music, e.g., foreground vs. background music (Yalch & Spangenberg 1988, Yalch & Spangenberg 2000), the tempo and volume of music (Milliman 1986, Milliman 1982, Oakes & North 2008), and the age of the patron (Yalch & Spangenberg 1990). Several studies point out that the outcome of ambient music is mediated by its congruity with other environmental cues. For example, the genre of music needs to be congruent with a restaurant's atmosphere to increase length of stay and spending (Wilson 2003, Baker, Levy & Grewal 1992, Grewal et al. 2003, Vida 2008). Finally, if customers like the music, they tend to evaluate the environment more positively (Dubé & Morin 2001), perceive waiting time to be shorter (Hui, Dubé & Chebat 1997, Bailey & Areni 2006), and spend more (Caldwell & Hibbert 2002). See also Oakes and North (2008) for an overview of congruity effects.

Also, scents and aroma as an interior variable have been examined, albeit with varying outcomes (Spangenberg, Crowley & Henderson 1996, Mattila & Wirtz 2001). Several studies have confirmed that the mere presence or absence of a scent has a significant influence on consumer behaviour, irrespective of the odour. Bone and Ellen (1999) identified 34 studies showing statistically significant effects of scent presence on consumers' response. In general it can be assumed that pleasantly scented environments lead to approach behaviours while unpleasant environments cause avoidance. This reaction may occur without customers even being aware of the presence of the smell (P. Ward, Davies & Kooijman 2007, Bradford & Desrochers 2009)The effect appears to depend on the specific type of the scent: Firstly, the scent needs to have a perceived association with the store-type to gain positive responses. Presence of a pleasant but non-associated scent may even lead to negative responses (Parsons 2009). Secondly, the presence of mediation variables, such as gender, needs to be considered. For example, one study confirmed that in the presence of gender-congruent ambient scent ('rose maroc' for men, 'vanilla' for women) shoppers perceive to have spent more time in the store, bought more items and spent more money on their purchases (Spangenberg et al. 2006).

During pre-Christmas periods, stores often combine seasonal music with ambient scents to enhance the effect. In an experimental setting the impact of four possible combinations (Christmas scent/no scent, Christmas music/no music) on respondents' intentions to visit a store were tested. While scents had a positive effect with music present, the effect was neutral or even negative when no music was present (Spangenberg, Grohmann & Sprott 2005).

Ambient temperature level was found to influence interpersonal attraction of people (Griffitt 1970). However, other studies found no measurable effect of temperature levels on desire to stay in a shopping mall (Wakefield & Baker 1998). It seems likely that while acceptable levels of temperature go unnoticed by customers, too high or low levels increase the probability of avoidance behaviour (Baker 1987).

The physical appearance of a firm's premises can have a positive effect on customer attribution and satisfaction. A study evaluating service companies showed that neat, well kept, organised customer service areas achieved higher satisfaction ratings by customers after a service failure occurred (Bitner 1990). Positive perceptions of the environment of a shopping mall have been shown to have some positive effect on the level of excitement, which in turn leads to higher repatronage intentions. The decor, layout, music, etc. of a mall are especially important to keep customers in a mall once they enter (Wakefield & Baker 1998).

2.2.3 Layout and Design Variables

There is an apparent lack of studies analysing how variables such as traffic flow, location of departments, and allocation of merchandise within departments impact the emotional states of customers and their behaviour. Most research in this area has dealt with the subject of store layout as a means to provide customers space to shop easily (rather related to the concept of crowding) or to control traffic flow on the floor (Levy & Weitz 2009, Hasty & Reardon 1996).

For example, a prominent floor display of a product increases sales significantly irrespective of the type or size of retail store (eg., Gagnon & Osterhaus 1985). Another article reports that the layout of merchandise in power aisle has an effect on perceived price levels (Smith & Burns 1996).

A separate research stream has emerged identifying the effect on online store layout and product positioning, claiming that predictions based on classical retail literature do not always apply (Vrechopoulos et al. 2004).

2.2.4 Point-of-purchase and Decoration Variables

In-store displays can be product displays, including point-of-purchase or shelf space, signs, cards or wall decorations. They play an important role in any retailers strategy, and therefore receive significant coverage in the literature (Berman & Evans 1995, Levy & Weitz 2009) however to our knowledge, no study investigates the environmental psychological aspects of interior displays.

Product displays in a store increase consumer's sensitivity to promotions and prices and decrease brand loyalty (Bawa, Landwehr & Krishna 1989). Studies showed also that the way how a product is displayed has an impact on the effect. For example, yoghurts displayed by brand lead to customers buying a larger variety of brands then if they are organised by flavour (Simonson & Winer 1992). Product displays increase the probability of unplanned purchase, but not of planned purchase. This effect is significantly stronger for product categories that are purchased relatively often (Inman, Winer & Ferraro 2009).

Studies have also shown that products are more likely to be chosen if they receive larger shelf space, however above a certain threshold, increasing shelf space does not lead to additional benefits (Curhan 1973). The best shelf positions are those located slightly below eye level or – in most but not all product categories – at the entrance point of the shelf (see for example Drèze, Hoch & Purk 1994) .

Attaching signs stating a promotional price in large letters to certain brands increases the likelihood of choice. While individuals which are likely to process additional issue-relevant information (*high-need-for-cognition* individuals) would only react if the price displayed actually was lower than the standard price, others change behaviour purely because of the signage being present (Inman, McAlister & Hoyer 1990). Furthermore, not only the content but also purely the amount of information contained on in-store displays positively influences consumer choice. When customers need to decide between two very similar products, they would prefer those which contain most information. However if a product is of superior quality to another, it is advisable to provide less information (Patton III 1981).

More recently, researchers investigated the effectiveness of in-store displays in an online retail environment (such as www.netgrocer.com or www.tesco.co.uk). Online shoppers can be equally influenced by environmental in-store stimuli (Vrechopoulos et al. 2004, Breugelmans, Campo & Gijsbrechts 2006). Examining effects for ten fast moving consumer goods, a study showed that displays can substantially increase brand market share, but that their effectiveness largely depends on the type of display, with displays located on the 'first screen' having the largest effect, followed by aisle displays. Shelf tag displays did not influence online buyers choice (Breugelmans & Campo 2011).

2.2.5   Human Variables

Retail personnel's number, appearance and behaviour impacts consumer's perception of a firm and therefore influences behaviour (Bitner 1992, Turley & Milliman 2000). For example, when service failures occur, employees dressed in unprofessional attire have been shown to negatively influence a customer's attribution and satisfaction (Bitner 1990). The number and friendliness of employees has a positive impact on levels of pleasure and arousal, which in turn impacts willingness to buy (Baker, Levy & Grewal 1992). Stores with more sales personnel on the shop floor greeting customers were perceived as providing a higher service quality then stores with less staff not offering a greeting (Baker, Grewal & Parasuraman 1994, Hutton & Richardson 1995).

The effect of other customers' presence has been widely discussed (Machleit, Eroglu & Mantel 2000, Machleit & Mantel 2001). An individual's assessment of the presence of others in a limited space will be referred to as the *perception of crowding*. It is important to differentiate this from *density*, i.e. the *actual* number of other shoppers present (Harrell & Hutt 1976). The perception of crowding can be either *human crowding* (a closed confined feeling experience from high human density) or *spatial crowding* (feelings of restricted physical body movements due to high spatial density) (Harrell, Hutt & Anderson 1980, Machleit, Kellaris & Eroglu 1994). Note that the feelings associated by the proximity of others can be related to both presence of people (a human variable), but is also to questions of store layout.

Several studies confirm that crowding has a negative influence on atmospheric perceptions, lead to negative emotions (unhappy, irritated), has a negative effect on satisfaction (Eroglu & Machleit 1990, Hui & Bateson 1991, Machleit, Eroglu & Mantel 2000) and in extreme cases even to emotional venting or confronting behaviour (Whiting 2009). However, density does not lead to negative perception of crowding if customers are in control over the environment (Hui & Bateson 1991). Also, a study conducted at two retail stores in Taiwan suggested a positive relationship between human crowding and pleasure (Li, J.-O. Kim & S. Y. Lee 2009), suggesting that culture could be an important mediator. The fact that Taiwan scores relatively low on the cultural dimension *individualism* (Hofstede 2001, Hofstede 2011) suggests that Taiwanese feel more comfortable if they are part of a larger group, compared to North Americans, for example.

Another positive effect of density on pleasure can be derived from *manning theory*, which states that every setting requires an optimal number of occupants to function effectively (Wicker 1979). If the density is lower than ideal, increasing the level of crowding will cause the retail functions to work more effectively, leading to increased pleasure levels with the consumer. For example an Apple Store may create a sense of an excitement when customers have to wait in line to get in (Wakefield & Blodgett 1994). It has been suggested that the relationship between crowding and emotions could in fact be inverse v-shaped, with emotional reactions to the presence of others turning to negative when the social size exceeds an individual's level of comfort (Argo, Dahl & Manchanda 2005). A study conducted in an extended service setting (a restaurant) showed that while crowding reduces levels of satisfaction when the objective is of a utilitarian nature (a quick bite to eat), it may increase satisfaction in extended hedonic service settings (an enjoyable meal, Noone & Mattila 2009).

2.3. Moderating Variables

The role of moderators has received relatively little attention although their importance was acknowledged early on (Mehrabian & Russell 1974). A study on food retail patronage found the general influencing characteristics to include age, gender, community, financial situation and marital status, as well as psychological factors such as role in family, lifestyle, value judgements, and personality. Finally, although largely neglected by researchers, *time* is an important factor (Lehota, Horváth & Gyenge 2006).

The servicescape model suggests to consider personality traits (e.g., arousal seeking) as well as situational factors (e.g., expectations, mood, plans and purposes, Bitner 1992). While strictly speaking part of the latter, motivational variables receive a separate section due to their importance in the retail setting (Babin, Darden & Griffin 1994).

2.3.1 The impact of personal moderators

A strong response moderator (see Figure 1) is the individual's personality traits. An early approach segments people into either *screeners*, and automatically filter out less important components of the environment, or *non-screeners*, do not filter, and are therefore more likely to get aroused by a complex and novel environment then screeners (Mehrabian & Russell 1974). A similar approach was taken by Grossbart et al. (1975), who have applied Zuckerman's Sensation-Seeking Scale to a retail environment: Although no empirical evidence could be provided, they argue that high sensation seekers would prefer complex, changing, unstructured environments, and therefore prefer shopping in high-load environments. They would also be more sensitive to stimulus features of the environment, then low sensation seekers (Grossbart et al. 1975).

A number of studies suggest significant gender to be a strong moderator (see Raajpoot, Sharma & Chebat 2008 for an overview). For example a study evaluating irritant shopping environments found that women are significantly more irritated by inappropriate temperature, size of store ('too small') or crowding (d' Astous 2000). Data collected in three Canadian shopping malls suggest that product assortment and accessibility has a lower effect on the emotional evaluation of the mall for women than for men, but did not show significant differences in the overall evaluation of the shopping experience at the mall. Sales people behaviour was shown to have a lower effect on overall evaluation for women than for men (Raajpoot, Sharma & Chebat 2008). The effects of in-store stimuli on unplanned purchases showed a stronger effect on women in a recent study (Inman, Winer & Ferraro 2009).

One study finds that the link between shopping enjoyment and intention to return to a shop is stronger for men than women. It argues that women enjoy shopping if it includes elements of browsing and comparing alternatives at various locations, and therefore leads to lower loyalty. Men, in turn, may want the experience to allow them to be decisive and complete their shopping quickly and efficiently (Hart et al. 2007). In line with this result, men tend to overestimate waiting times in retail stores, which is of high relevance, because wait expectations have shown to have a negative effect on store patronage intentions (Grewal et al. 2002).

The effectiveness of colour schemes is also being mediated by gender, for example males were twice more likely than women to choose shades of blue as their favourite colour, and females were are more likely to choose pink and purple in a study by Ellies and Ficek (2001). Environmental scent was shown to have a stronger effect in a clothing store if gender specific scents were used in congruence with male/female product offerings (Spangenberg et al. 2006).

With increasing age, shoppers are increasingly irritated by inability to find what one needs, bad smells, cleanliness, being deceived by a salesperson, and high pressure selling (d' Astous 2000). Working women consider employee behaviour in shopping malls more important than homemakers, whereas homemakers are more concerned about accessibility and their overall evaluation are stronger influenced by emotional responses. Repatronage decisions where significantly influenced by overall evaluation of the mall only in case of working women (Raajpoot, Sharma & Chebat 2008). Household size, for instance, increases the likelihood that an in-store stimuli triggers unplanned purchases, presumably because it becomes more difficult to remember each household member's needs (Inman, Winer & Ferraro 2009).

2.3.2. Shopping motivation

Among the several competing theories of shopping motivation (Tauber 1972), the typology offered by Westbrook & Black (1985) provides a most helpful classification: Motives can be either *product-oriented*, *experiential* or a combination of both. A customer may visit a store due to a specific product need or in search of product information (product-oriented or *utilitarian* motivation). In this case, a shopper may assess the 'success' of his/her trip as he/she would evaluate performance at work, for example. Experiential, *hedonic* shopping creates value from fun and playfulness, from the potential entertainment and the emotional worth of the activity (Dawson, Bloch & Ridgway 1990).

While both dimensions are positively correlated to feelings of pleasure and arousal, hedonic values have a significantly stronger effect (Babin, Darden & Griffin 1994). One study suggests that product motives have a stronger association with pleasure than arousal, whereas experiential motives showed a stronger impact on arousal then pleasure (Dawson, Bloch & Ridgway 1990). However, in most, if not all cases, motives may have both product and experiential elements, where the objective is to both directed towards specific products, but also recreational (Westbrook & Black 1985).

Also consumer's *expectations* regarding the level of arousal and dominance have been shown to affect the emotional effect of atmospherics. Shoppers with ambiguous goals expecting (and experiencing) higher levels of arousal have displayed higher levels of pleasure in simulated shopping exercises (Kaltcheva & Weitz 2006, Massara, Liu & Melara 2010).

An alternative approach suggests that the shopping orientation of consumers can be segmented in a two-by-two matrix with one dimension being a preference for a *cost effective* or *comfortable* shopping experience and the other dimension being a *brand preference* or *price consciousness.* Retailers tend to focus on one of the four segments, as it becomes increasingly difficult to appeal to all shopping motivations at the same time (Schmalen & Simon 1998).

2.3.3 Situational factors as moderators

People differ in terms of how much of their intentions are transformed into behaviour. Based on Kuhl's (1982) theory of action control, it has been argued that people can either have a tendency to approach or avoid things in a static (passive) or in a dynamic (active) fashion (Bagozzi, Baumgartner & Yi 1991). Decisions by passive or state-oriented consumers are influenced by their social and emotional surroundings and are less likely to plan their behaviour in advance. Action-oriented consumers are less influenced by environmental stimuli and more guided by intrinsic goals (Babin and Darden 1995).

Mood states of shoppers have direct and indirect effects on shopping behaviour. Consumers in good moods are more likely to perform tasks with positive outcomes (such as trying on clothes), and may also evaluate shopping encounters more positively. The mood before the service encounter is an important moderator of the environmental psychology, but the mood is also influenced by the environment, and changes during the process (Gardner 1985). Another situational factor is people's time sensitivity. More time aware but also more aggressive shoppers are more affected by negative effects of human crowding then others (Harrell & Hutt 1976).

Psychologists refer to people as *maximizers* when they seek to make the best possible decision in a wide range of situations, while *satisficers* are those who are likely to settle for solutions which are may be less than ideal but good enough (Schwartz et al. 2002). It may be hypothised, for example, that maximizers are less influenced by cues which do not contain product related information (environmental music, colour schemes, etc.). Maximizers have a higher propensity to browse among the choice options, especially when a large number of options are made available. They may experience more stress and unhappiness in day-to-day purchase decisions when under time pressure (Chowdhury, Ratneshwar & Mohanty 2009).

2.4   *Pleasure, Arousal and Dominance*

Understanding emotions is important, because they are causing consumer's reaction to either approach or avoid an environment (Aubert-Gamet 1997, Hutton & Richardson 1995), making them the key link between atmospherics and consumer behaviour. Several studies have shown that servicescapes affect customers' emotional states, by either enhancing or suppressing them (Hui & Bateson 1991, Baker, Levy & Grewal 1992, Wakefield & Baker 1998). However emotions are difficult to verbalise and transient and thus difficult to recall (Donovan & Rossiter 1982). The original PAD-model states that *pleasure*, *arousal* and *dominance* are sufficient to capture emotional effects caused by consumer environments (Mehrabian & Russell 1974). This view was confirmed by a study examining the underlying factors of 36 items measuring a number of basic emotions in consumption behaviour (Havlena & Holbrook 1986).

The three dimensions are conceptually orthogonal, however the model suggests a co-dependency of pleasure and arousal: When pleasure is neutral, i.e. neither pleasing nor displeasing, moderate levels of arousal cause approach behaviour whereas very high or low levels of arousal cause avoidance (Donovan & Rossiter 1982).

Mehrabian and Russel (1974) measured pleasure and arousal with 8 items each, *contented*, *happy*, *satisfied*, *pleased*, *relaxed*, *important*, *cares*, *hopeful* (loading high on the factor pleasure) and *stimulated*, *excited*, *jittery*, *aroused*, *frenzied*, *autonomous*, *wideawake*, *controlling* (representing the factor arousal). Other studies have used reduced measures while still achieving acceptable levels of computed reliability. One study used 4 and 3 items achieving alpha scores of .72 and .64, respectively (Ridgway, Dawson & Bloch 1989). Scales with six elements each were also used, with alpha values of .88 and .77, respectively (Donovan et al. 1994). Higher reliability coefficients where reached when each dimension was measured with six semantic differentials, e.g., happy/unhappy, unsatisfied/satisfied and so on for 'pleasure'. In one study with 130 undergraduate students in a laboratory setting, alphas of .95 for pleasure, .76 for arousal and .83 for dominance where achieved using this approach (Spangenberg, Grohmann & Sprott 2005).

Dominance represents the feeling of the customer controlling as opposed to being controlled and being influential as opposed to influenced. This may be increased by clear signage, or increased personal space (Bitner 1990). In situations of crowding, dominance has been shown to be relevant (Machleit & Eroglu 2000). Several studies suggest that dominance is an independent or even moderating variable. Perceived control may be an antecedent of pleasure influenced by both consumer density and consumer choice. Depending on the service setting, perceived control can lead to high pleasure in a high density bar, but to low pleasure in a crowded bank (Hui & Bateson 1991).

Dominance has been deemed unnecessary by several studies, with the two orthogonal dimensions of pleasure and arousal being sufficient to represent emotions (e.g., Ridgway, Dawson & Bloch 1989, Sweeney & Wyber 2002). Furthermore, there may be emotions who load high on both dimensions, and create four additional vectors. For example, *boring* would be the combination of unpleasant and unarousing, and so forth (Russell & Pratt 1980, Törőcsik 1995). One study has developed a measurement instrument based on the eight emotional states, called the *affect grid*, and applied this in a study in which 270 students were asked to indicate their emotional state in the grid, which is a 9 x 9 matrix along the dimensions pleasure and arousal, allowing to simultaneously indicate a response on both dimensions (Dubé, Chebat & Morin 1995).

A recent expansion of the model discussed the gap between expected and experienced levels of dominance and arousal. In this study, the two latter variables are considered moderators to the organism within the S-O-R typology, and were shown to positively/negatively influence the effect of store atmospherics on pleasure if expectations were met/not met (Massara, Liu & Melara 2010).

It has been suggested that even small changes in the environment can influence the customers' mood, for example a quick smile of a salesperson or having to wait too long for a doctor's appointment (Gardner 1985). Arousal interacts with pleasure to cause approach type behaviours in pleasant servicescapes and

avoidance in unpleasant servicescapes (Donovan & Rossiter 1982, Donovan et al. 1994, Aubert-Gamet 1997). Next, these behaviours will be discussed in more detail.

2.5   Approach and Avoidance Behaviours

Customers reactions can be allocated to one of two groups: According to the Mehrabian-Russel model, the emotional reaction to a servicescape lead can be to approach or avoid it (see Table 3 below). Approach/avoidance covers four aspects of behaviour: (1) Store patronage intentions, (2) exploration inside a store, (3) desire to communicate with others, and (4) satisfaction and performance, including time and money expenditures (Mehrabian & Russell 1974).

Approach versus Avoidance behaviours   Table 3

Approach	Avoid
Desire to physically stay in the environment	Desire to leave the environment
Desire/willingness to look around and explore the environment	Avoid moving through or interact with environment
Desire/willingness to communicate with others in the environment	Avoid interacting with others, or ignore communication attempts from others
Enhancement of performance and satisfaction with task performances	Hindrance of performance and satisfaction with task performances

Source: Mehrabian and Russel, 1974

In fact, the approach/avoidance construct has proved somewhat difficult to measure. A factor analysis of eight items constructed for the retail environment suggests, that one single factor only covers approach-avoidance in the sense of "attitude toward the act" (such as 'enjoy shopping', 'intention to return') rather than intentions to spend more money or time. The authors therefore suggest to use measure effects using three factors (Donovan & Rossiter 1982). This is unfortunate, since the last two factors are arguable most important to practitioners: A review of servicescape studies found 25 discussing the effect of environmental variables on sales, and 16 dealing with effects on actual or perceived time spent in the environment (Turley & Milliman 2000).

Decisions to patronise a store, spend more time, and buy are based on the total service offering, with the servicescape surrounding the service and being therefore an important part of the evaluation process (Hutton & Richardson 1995). The shopping environment influences every customer's emotional state, which in turn is determining a specific behaviour. Moderating variables either strengthen or weaken this effect.

3. Suggestions for Future Research

The above review suggests that there is still some unknown territory to be discovered. This section lists a number of areas for further research, and was written with the intention to promote further investigation rather than criticize the achievements reached so far.

Firstly, we propose to further investigate the role of moderators of the effect of atmospherics on consumer behaviour. The majority of studies discussed above assume that the environmental stimuli have an effect on behaviour moderated by the consumer's emotional states (PAD). There has been some debate about the role played by the state described as 'dominance': Some studies could not identify a significant effect of the dominance dimension on behaviour (Donovan & Rossiter 1982), while others see an important role in situations where personal control of the servicescape is deemed to be important, for example in situations of crowding or time pressure (Machleit & Eroglu 2000). Furthermore, it has been suggested that the effect of arousal may be dependent on the level of pleasure (Donovan & Rossiter 1982, Donovan et al. 1994), although more empirical evidence is needed to fully understand interaction effects. Also, little is known about the ideal level of arousal to date. While it may be safe to assume that pleasure is strictly positively correlated to approach behaviours, too high levels of arousal (such as anxiety, stress) may lead to avoidance. For example, airport retailers noted that people generally don't shop until after they have cleared check-in procedures and passenger security screening, because they are overly nervous (Perng, Chow & Liao 2010).

Gender and age has been suggested as moderators by numerous authors, and a few studies discuss how a consumer's personality traits mediate the effect of atmospherics, for example *screeners* vs. *nonscreeners* (Mehrabian & Russell 1974), or *maximizers* vs. *satisficers* (Schwartz et al. 2002). In addition to this, a differentiation of first time versus repeat visitors may be important. For example a special scent or music may pleasantly surprise first time visitors (cause arousal) but have a different or no effect on repeat customers as the novelty wears off (Morrison et al. 2011). The moderating effects of a customer's culture has recently sparked some interest (e.g., Seock 2009) but is far from being fully understood. This is surprising because today's multicultural societies require retail managers to understand the different effect of their servicescapes on different ethnic groups.

Secondly, in order to further increase the quality of studies, some methodological improvements should be considered. Several studies were conducted in virtual retail environments, using videos or computer simulated stores. Although it is generally claimed that these are sufficiently realistic (Burke et al. 1992), it is unlikely that participants can simultaneously assess sounds, smells, presence of others and signage unless they are in an actual store. Among the studies conducted in a real life environment, few are set in more than one store. In order to ensure that results can be generalised, it may be useful to repeat several of the existing studies at other store types at several locations (Morrison et al. 2011). As most empirical studies in real world settings involve interviews after customers leave a store, many studies include a 'self-selection' bias towards shoppers. There is also a lack of longitudinal studies (with the notable exception of Donovan-Rossiter, 1982). As the environmental cues may change significantly along the shopping path, and there could also be a time lag between service encounter and emotional states changing, marketers need to understand how behaviours change along the shopping process.

The wide range of open questions indicate that despite being over 35 years of age, the field of environmental psychology still offers plenty of research opportunities.

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