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The Effects of A Visually Warm (Vs Cold) Retail Design on Store Patronage Intentions

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Abstract

This study attempts to build and test a model based upon the principles of Grounded Cognition theory and the S-O-R Model by establishing visual elements of warmth as antecedents of feeling crowded. Through the means of a serial and parallel mediation analysis field experiment, the current study aims to investigate the impact of visual elements on approach-avoidance behavior in an in-store environment. Results show that altering certain environmental and architectural elements related to the visual warmth in a retail setting can successfully manipulate consumers perceptions regarding retail crowding. More specifically, both visually warm and cold environments were found to have a direct effect on avoidance behaviors, while only visually warm environments were found to have an impact on the perception of feeling crowded. The mediation analysis additionally revealed variables like perceptions of feeling crowded, brand attachment, preference for social interaction, and positive emotions that mediate the relationship between visually warm environments and approach avoidance behaviors. In comparison, these variables were not found to have any mediation effect on the relationship between visually cold environments and approach avoidance behavior. Findings from this research can be used as guidelines for designing retail store interiors, making them more likely to attract and sustain a higher level of footfall and desired approach behavior in consumers.

Keywords: *Grounded Cognition, Atmospherology, Emotions, Crowding, Store atmospherics, Visual design, Warmth, Sensory Marketing*

1. Introduction

Marketing research across the globe has been fundamentally concentrated on eliciting favorable responses from consumers, and to this end, achieving this has become akin to the holy grail for marketers. Therefore, one of the most significant developments in marketing pertains to the realization of how store environments impact consumers' purchase decisions. This revelation highlights that for consumers, in addition to product features, the place of consumption or where it is purchased

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has great importance, to such a degree that its power as a marketing tool can often overshadow the products and brands on display (Kotler, 1973). Since then, various design elements are fashioned in a manner to illicit specific cognitive and affective responses in the consumers (Tantanatewin & Inkarojrit, 2016; Bijandi, Sadeghi, & Fereshteh, 2001) and also alter the perceptions of crowding (Madzharov, Block, & Morrin, 2014).

One architectural element that has recently gained traction is visual warmth. From an architectural standpoint, for a place to be regarded as warm, the tactile temperature of the location is not enough; rather, it is the various design components that lead to the perception of warmth (Wastiels, Schifferstein, Heylighen & Wouters, 2012; Reagan, 2012). According to Fisk, Cuddy and Glick (2006), warmth judgment carries significant weight in formulating cognitive, affective, and behavioral judgments about an individual. Individuals perceived as warm are seen as trustworthy, generous, and supportive (Bargh & Shalev, 2012). Based on the theory of Grounded Cognition, this presents the notion that concrete experiences (such as temperature) are grounded in abstract concepts (positive feelings) with which they are experienced (Barsalou, 2008). Similar implications hold true for environment and space as well; a visually warm store has been found to generate positive evaluations for the products as well as the brand retailer by consumers (Zwebner, Lee & Goldenberg, 2013; Baek, Choo, Oh, & Yoon, 2018).

From extant literature, Lyu, Krasonikolakis and Vrontis (2022) categorized constructs relating to store atmosphere into discrete categories like "store-driven", "customer-driven", "service-driven", "emotional", "behavioral", and "psychological" factors. Store-driven factors like store layout and store ambient cues have been given special attention in the literature (Lyu et al., 2022): store layout factors due to their impact on store performance and customer behavior (Page, Trinh & Bogomolova, 2019; Pantano, Pizzi, Bilotta & Pantano, 2021); and store ambient cues (music, color, lighting) in light of how they influence customer moods and emotions (Chatzopoulou, Tsogas, & Kyriakou, 2021; Mari & Poggesi, 2013; Vos, Galetzka, Mobach, Van Hagen & Pruyn, 2019). While store layout's impact on perceived crowding and subsequent consumer behavior has been studied (Alawadhi & Yoon, 2016; Boutsouki, 2019), there has been no significant representation of the relationship between ambient cues such as visual warmth and perceived crowding and subsequent approach-avoidance behaviors. rendering the existing marketing frameworks regarding atmospherics and crowding incomplete. The objectives of the current study are therefore predicated on identifying and establishing the comparative differences visually warm and cold store designs have on consumer emotions and the ability to amplify approach avoidance behavior. Additionally, the study aims to ascertain how these design elements

serve as an antecedent to perceptions of feeling crowded and, in turn, develop an understanding of how these perceptions impact the attachment consumers have with brands as an alternative to social connectedness.

2. Theoretical Contribution

This study attempts to fill this gap by building on frameworks proposed by Baek et al. (2018) and Huang, Huang, and Wyer. (2018) by establishing visual elements of warmth as one of the antecedents of feeling crowded and studying the impact of these upon approach-avoidance behavior, which are the behavioral responses consumers' exhibit in an in-store environment (Donovan & Rossiter, 1982). Considering that past studies have found the consumer approach-avoidance behaviors to be linked to brand image of stores (Sharma et al., 2022), the current study aims to make a contribute by establishing the role of visual design elements as antecedents of the overall store brand and how these can have an impact on the perceptions and emotions of consumers. This will subsequently allow the study to identify if a direct causal link exists between in-store visual design and intentions of actually visiting stores which serve as a viable proxy to the real behaviors that consumer exhibit in regards to store visits and purchases (Donovan & Rossiter, 1982). The study will hence address limiitations of previous studies like Kumar and Kim (2014) and Baker et al. (2020) which only established the correlation between store environments and consumer behavior but were establish if an actual causal relationship can be said to exist.

2.1.Methodological Contribution

As mentioned before, previous research has only managed to establish correlations between visual designs, brand attachment, perceptions of crowdeness, emotional response and approach avoidance behaviors. To make a significant methodological contribution and address this gap, the study has proposed to carry out a field experiment. To avoid compromising on ecological and external validity, the field experiment was carried out closer to natural settings to allow for more accurate insights on the effects of visually warm design and extend current knowledge through methodological contribution by means of identifying causal links between the proposed variables. The study also aims to address the limited understanding of the contrivances of visual warmth, the relationship between social and physical warmth, the independent effect of visually warm colors, and the positive outcomes of crowding (Andrews, Luo, Fang & Ghose, 2015; Fenko, Schifferstein & Hekkert., 2010; Mehta, Chae, Zhu & Soman, 2011).

2.2. Research Questions

Based on the points of discussion from the previous sections, the following research questions serve as the foundation of the current study:

Q.1 What are the ways in which a visually warm store design augments the desired approach behaviors compared to a visually cold store design?

Q.2 What is the effect of warm visual design elements as antecedents to feeling crowded?

Q.3 Can the effect of feeling crowded on consumers' attachment to brands be ascertained as an alternative to social connectedness?

Q.4 What are the ways in which visually warm and cold store designs affect emotions?

By answering these research questions, the study aims to identify how the influence of visual design has on consumer approach behaviors based on the perceived warmth/coolness of the in-store visual design. This will be done by identifying the antecedents that lead to the perception warmth of the visual design of a store. Additionally, the study will study how each of these antecedents contribute to consumers feeling crowed in an in-store setting. The perception of crowdedness will be further studied in regards to its influence on brand attachment and how this attachment to brands serves as an alternative to social connectedness that consumers experience. Finally, the study will establish the emotional impact visual design has on consumer in an in-store setting and how consumer emotions impact consumer behaviors. Holistically, the study aims to provide an understanding to managers that by the means of controlling various visual design elements, there is a potential to influence consumer emotions and perceptions leading feelings of attachment, prospectively enabling managers to manipulate and guide consumers behaviors and intentions that have the ability to create the greatest value.

2.3. Literature Review

2.3.1 Visually warm/ cold design

From an architectural standpoint, for a place to be regarded as warm, it is not pertinent or contingent upon increasing the tactile temperature of that place; rather, it is the various design components, including the interior color, material, furnishings, textured walls, and in some cases even the scent, that determine whether a place is regarded as warm (Wastiels et al., 2012; Reagan, 2012). Warmth experienced through the visual design elements of a retail space can induce the concept of physical warmth in consumers, a phenomenon that can be explained through the concept of 'grounded

cognition'. There has been a recent resurgence with respect to 'grounded cognition' theory, which posits that concrete experiences such as temperature are grounded in abstract concepts like the positive feelings with which they are experienced. This happens as visual cues of warm design elements trigger explicit memory of an experience (stored associations) in the mind of an individual without even experiencing the physical warmth (Barsalou, 2008; Krishna, 2012). Familiar situations or images stimulate human brains and activate specific modalities stored in the memory, allowing for behavioral patterns to be established (Barsalou, 2008). As such, warmth is explained as a positive physiological arousal evoked as a result of visual warmth stimuli, which induces feelings of joy, comfort, a sense of belongingness, and trust among individuals (Aaker, Stayman & Hagerty, 1986).

The visual environment of a space consists of several important cues; in particular, color has emerged as the most dominant. Several studies have been carried out in order to compare the effects of warm and cool colors on consumer behavior in different settings; largely, the findings have been consistent in determining that warm colors evoke warmth perceptions as predicted by grounded cognition theory (Mehta et al., 2011). Indoor colors in particular have been found to have a profound effect on the perceived warmth of a retail space. Prior research shows certain colors of long wavelength, including red, orange, and yellow, are perceived as warm and exciting and lead to consumers spending longer time in a retail space, whereas colors of short wavelength, blue and violet, have been found to be calm and cool and demonstrate reliability (Hidayetoglu, Yildirim & Akalin, 2012; Tantanatewin & Inkarojrit, 2016). Colors are associated with different temperatures, in line with conventional beliefs. Warm color and material have been found to generate both physical and emotional warmth, leading to feelings of intimacy and a friendly atmosphere (Taft, 1998; Fenko et al., 2010). According to Itten Birren and Van Hagen (1970), the effect of colors needs to be understood not only in a visual sense but also in psychological and symbolic form. Several studies have established that in a physical context, warm colors have been found to affect the temperature estimates of a room, to the effect that people standing in warm-colored rooms do not feel the drop in temperature as quickly as people in cool-colored rooms, as was evident by the experiment carried out by Choi, Chang, Kil-Jae and Chang (2016) in their study. Overall, as Wang, Qian and Li (2019) note, warm, saturated colors have a direct influence on the purchase behaviors of consumers.

Apart from color, other design elements, including the tactile texture of the material used, furnishings, and even the scent, independent of the thermal properties, can affect the warmth perception of a space. People generally perceive flat and smooth-surfaced walls, surfaces, and floors as cooler to the touch, whereas textured

materials are perceived to be warmer, with the common belief prevailing that rough surfaces are more likely to retain heat (Escobar, Velasco, Byrne & Wang, 2022). In this regard, Wastiels et al. (2012) and Coşgun, Yildirim and Hidayetoğlu (2021) found out that glass and steel as materials are regarded as cool, and finely textured elements like wood and brick are considered to be warm. Therefore, rooms built with brick or stone walls containing wood furnishings and other décor items such as carpets and rugs can create a scene of visual warmth for people without increasing the thermal temperature of a place (Jha, Balaji, Peck, Oakley & Deitz, 2020).

2.3.2. Feeling crowded and preference for social interaction

Business literature has largely remained inconsistent in defining and conceptualizing key terms related to crowding (Pons, Laroche & Mourali, 2006). As a result, concepts such as density and crowding have been used interchangeably, despite having completely different theoretical underpinnings and implications, leading to multiple incoherencies to surface which contribute to the lack of clarity and integration of these concepts by the marketing discipline. Therefore, to understand the concept of "feeling crowded", comprehending the concepts of density and crowding is imperative. Density as explained by (Stokols, 1972; Eroglu & Machleit, 1990) refers to the physical number of people present per unit of space in a particular setting. According to Meyers-Levy & Zhu (2007) various spatial and architectural arrangements in a retail setting such as congested aisle spaces, over towering shelves and, lower ceilings are likely to illicit feelings of being spatially constraint within the consumers. This in result will affect the way they process stimuli and their subsequent behavior in a given setting.

Feeling crowded could be further explained as the state in which individuals experience space to be more crowded and limited than it actually is and feel decreased levels of perceived control over their social environment due to seemingly high social density. The feeling that there is a higher degree of social interferences by others and circumstances are more controlled by elements outside their control results in them feeling crowded and inhibited (Hui & Bateson, 1991; Machleit, Eroglu & Mantell, 2000). Crowding, therefore, has been conceptualized as the particular negative response and stressful outcome exhibited by individuals to a dense situation or an environment (Stokols, 1972; Eroglu & Machleit, 1990). Whether an individual perceives a space to be crowded or not depends upon various spatial, individual, social, and situational factors and, as such, is seen as being psychological in nature (Whiting & Nakos, 2008).

Prior literature has focused primarily on the negative relationship between crowding and consumers. However, a number of studies have addressed this inherent bias by looking at the potential effects crowding may have. Eroglu and Machleit's (1990)

hallmark study on crowding put forward functional density as a positive outcome of crowding. This has been backed by findings from Tse, Sin and Yim (2002) that consumers attribute high quality of food, reputation, and low price to restaurants with a high level of crowdedness; essentially, for brands and retailers, the lack of crowd may be seen as a negative in certain settings (Pons et al., 2006; Whiting & Nakos, 2008). Additionally, in response to the perceived threat to their personal space due to crowding, individuals assert their control by indulging in various power-compensatory behaviors (Evans & Wener, 2007; Rucker & Galinsky, 2008). These behaviors are often exhibited in the form of increased preference for premium brands, greater spending on luxury products, an increased number of total purchased products (Madzharov, Block & Morrin, 2014; Schöniger & Adler, 2022), an enhanced store image (Tse et al., 2002), and displaying confidence in the choice of retail outlet (Eroglu & Machleit, 1990).

A factor linked to perceived crowding is the preference for social interactions. Burger (1995), in his study regarding solitude, posits that the absence of social interaction by people is generally considered as them physically isolating themselves from others. Avoiding unwanted social interactions with people present in their surroundings is another way consumers try to reassert control over their personal space (Huang et al., 2018), an approach that allows for greater focus on the product or brand being purchased and the formation of attachments with them in order to satisfy the need for belongingness. According to Blut & Iyer (2020), social crowding invokes feelings of stress and anxiety in people, and as a result, they exhibit an inclination to be socially avoidant. Feelings of crowdedness have been linked to individual responses to social and spatial density; as portrayed by the meta-analysis by De Oliveira, Ladeira, Sampaio and Perin (2020), these responses manifest in the form of positive and negative emotions, perceptions of the environment's perceived value, and consumer attitude, behavior, and loyalty.

Multiple studies report a meaningful relationship between temperature, social density, and spatial proximity; as temperature increases, the feeling of crowdedness rises, despite the actual spatial proximity remaining static (Ijzerman & Semin, 2010). In a further study carried out using warm scents by Zwebner et al. (2013), consumers reported experiencing a greater degree of social density due to spatial bias, even though actual temperature and social density remained unchanged, ultimately leading to higher purchases of more high-end luxury products. More recently, Zhao and Guan (2023) confirmed that warmth and colors directly impact how consumers perceive space and the feeling of crowdedness within a retail environment. However, as Almeida, Botelho and Pereira (2019) suggest, there is still space to study the relation between visual design elements, specifically colors, in regards to their influence on

perceived crowding and social proximity. It can hence be hypothesized that feelings of crowdedness in consumers can be successfully manipulated by introducing a spatial bias to a certain extent by altering certain environmental and architectural elements related to the dimension of perceived temperature in a retail setting to generate desired positive consumer behavior.

H1: A visually warm (vs. cold) store design will increase perception of feeling crowded.

2.3.3. Brand attachment

Brand attachment is defined as the strength of the bond connecting oneself with the brand as exemplified by brand-self connection, characterizing the brand as a part of oneself (Park, MacInnis, Priester, Eisingerich, & Iacobucci, 2010). According to Shimul (2022), literature on the conceptualization of brand attachment can be split into four distinct streams: 1) a sense of self-extension towards the brand; 2) the self-connection of consumers to the brand and the expression of brand-related thoughts; 3) the link between a brand and the consumers' sense of self; and 4) the dependence of the level of attachment to a brand on person-brand interactions. Ultimately, as Malär, Krohmer, Hoyer and Nyffenegger (2011) note, the foundation for brand attachment is the emotional connections consumers choose to form with brands. Major theoretical perspectives that stem from brand attachment include attachment theory, self-congruence theory, relationship theory, and self-determination theory (Shimul, 2022). Based on these theories, relations with brands can be said to substitute human relations based on trust and emotional connections (Singla & Gupta, 2019), leading to the formation of bonds that provide security from perceived physical and psychological threats in the consumers' proximity (Rabbanee, Roy & Spence, 2020) and allow them to ensure their psychological needs as a means of retaining a degree of control over their environment (Lin, Zhou & Leckie, 2020).

In particular, perceived crowdedness in retail settings induces perceptions of threats to personal space; as part of the resulting social avoidance behaviors, consumers often resort to developing attachments to brands not as substitutes but rather as alternatives to social connectedness (Eroglu & Machleit, 1990; Hui & Bateson, 1991; Huang et al., 2018). When their personal and physical space feels invaded, consumers develop attachment to non-human objects such as brands in order to avoid any unwanted social interaction and to manage their need to belong (Fournier, 1998; Evans & Wener, 2007; Park, Eisingerich & Park, 2013). For example, Andrews et al. (2015) found that consumers on crowded subways reported a higher interest in mobile ads as compared to those on non-crowded subways, as these advertisements served as a welcome relief from social interaction. However, as Shimul (2022) highlights, the link

between perceived crowding and brand attachment is underrepresented in literature. Based on this, there is value in hypothesizing a relationship between feeling crowded and brand attachment.

H2: Feeling crowded will have a positive impact on brand attachment

2.3.4. Approach-avoidance behaviors

Approach-avoidance Behaviors are defined as the various behavioral responses that consumers exhibit in in-store settings (Donovan & Rossiter, 1982). The concept of approach-avoidance behaviors has its basis in Russell and Mehrabian's (1974) proposed Stimulus-organization-Response model. As highlighted by Choudhary and Sharma (2018) and Tang and Zhang (2020), the proposed model helps explain the emotional and cognitive responses like arousal, pleasure, fear, and dominance that individuals may have to the sensory, temporal, and spatial stimuli from the environment and the resulting behaviors of approach, exploration, flight, affiliation, and performance, amongst others.

Orth and Wirtz (2014) present the consumer's intention to approach a store, explore and browse through the available products, willingness to stay and interact with store personnel, and patronage intentions as desired approach behaviors. Contrarily, avoidance behaviors manifest themselves in the opposite manner, exhibited through consumer dissatisfaction, feelings of boredom and anxiety, reluctance to return to a store or spend time exploring, and unfriendliness towards others (Donovan & Rossiter, 1982). One of the primary factors that influence in-store patronage is the brand of the store itself. Studies like Kumar and Kim (2014) established that the "store as a brand" strategy has been found to have a strong influence on the affective and cognitive responses consumers have a store. The brand image of store is dependent on elements store prestige, equity and affect (Badrinarayanan & Becerra, 2019); store atmospherics (Ndengane et al., 2021) and; store environment and visual merchandising (Sharma et al., 2022), leading to store attachment which further has a direct impact on the potential store patronage of consumers.

There are several studies that have demonstrated how emotions play a key role in translating approach-avoidance behaviors into actions. The emotional state of pleasure induced by in-store design elements is found to increase satisfaction among shoppers, which in turn enhances their approach behaviors (Bitner, 1992). In a study carried out, comparing warm and cool scents led to perceptions of greater social density within the retail space, causing an emotional response that ultimately induced respondents to indulge in the power-compensatory behavior of making luxury purchases, a phenomenon known as "temperature premium" (Zwebner et al., 2013). Warm indoor

colors of long wavelength have also been found to be perceived as exciting and warm by consumers, directly affecting the emotional state of arousal and leading to consumers spending longer time in a retail space (Donovan, Rossiter, Marcoolyn & Nesdale, 1994; Tantanatewin & Inkarojrit, 2016). More recently, studies like Nguyen and Nham (2022) and Tri, Kim and Nga (2020) have confirmed that ambient factors like store design, which include the colors, do have a direct impact on the behavioral intentions of consumers and hence can be linked to approach avoidance behavior. Furthermore, as Huang et al. (2018) note, the negative response consumers have to feeling crowded leads them to attach themselves to brands as a means of security, which significantly alters their behavioral intentions. The hypothesized relation between store design and desired approach behaviors can hence be stated as follows:

H3: A visually warm (vs. cold) store design can increase desired approach behavior

H4: The effect of feeling crowded on approach-avoidance behavior is mediated by brand attachment.

2.3.5. Emotions

Emotions are conceptualized as a set of discrete affective temporary states that can be either positive or negative (Yoo, Park & MacInnis, 1998). Existing literature has chronicled a shift in the dimensions of consumers' emotions in the retail context, especially when it comes to atmospherics and design elements. The store environment serves as a potent and highly effective marketing tool; the color of the store alone serves as a powerful factor in physically attracting consumers to the retail outlet by causing pleasure (Lin, 2004). In fact, in many cases, the primary goal of creating specific retail environments is to elicit certain emotional responses in consumers, which will in turn lead to a desired behavioral action (Kotler, 1973). Therefore, the need to study specific emotional reactions with regard to in-store design elements is even more significant now, particularly in light of the continuously evolving retail dynamics. Studies show that as a consumer walks into a retail space, various design elements such as color, lighting, music, scent, and temperature trigger different emotional reactions. Ambient designs have been able to arouse emotions of pleasure, as identified by Lin and Worthley (2012). Warm temperatures, lights, and colors communicate a feeling of comfort and energy, which diminish negative emotional reactions such as feeling tensed or rushed. A study by Quartier, Vanrie and Van Cleempoel (2014) demonstrated that ambient conditions are inherently linked to in-store time spent, the amount of in-store spending, and willingness for repeat visits. More recently, studies like Nguyen and Nham (2022) and Tri et al. (2020) have confirmed that ambient factors like store design, which include the colors, do have a direct impact on the behavioral intentions of consumers and hence can be linked to approach avoidance behavior. This allows

the study to posit the following hypotheses:

H5: The effect of visually warm (vs. cold) store design on approach-avoidance behavior is mediated by feeling crowding and brand attachment.

H6: The effect of visually warm (vs. cold) store design on approach-avoidance behavior is mediated by feeling crowding, preference for social interaction and brand attachment

Mehrabian and Russell's (1974) proposed framework (PAD) specified human emotions in three categories: pleasure, arousal, and dominance. In the context of retail, the emotional states related to arousal and pleasure have been found to be of utmost significance. Sherman, Mathur and Smith (1997) identified pleasure as the emotion that directly corresponded to the amount of time a consumer spent in a retail outlet, the affinity felt for the store, and arousal with the amount of money spent and items purchased. However, the relationship between store design elements and emotional reactions is more nuanced than it initially appears. Studies show that the processing styles of consumers have been found to moderate the relationship between emotional responses and the environment. Therefore, it is extremely critical to identify consumers' psychological processing abilities when exploring the effects of environmental stimuli on their emotions and behavior (Wolak & Marcus, 2006; Lin, 2004). Cognition precedes emotions when in-store environmental cues are being processed by consumers and is then again affected by that emotion later in the process stage. The relationship between store design, emotion, and approach avoidance behavior is proposed as follows:

H7: The effect of visually warm (vs. cold) store design on approach-avoidance behaviors of the consumers is mediated by positive emotions

H8: The effect of visually warm (vs. cold) store design on approach-avoidance behaviors of the consumers is mediated by negative emotions

The conceptual framework representing all of the aforementioned hypotheses are shown in Figure 1.

3. Methodology

3.1. Research approach and design

Based on the objectives of this study, the current research adopted an empirical research approach, making use of a field experimentation design, a structured form of inquiry that takes place in a real-life setting. Field experiments have the advantage of

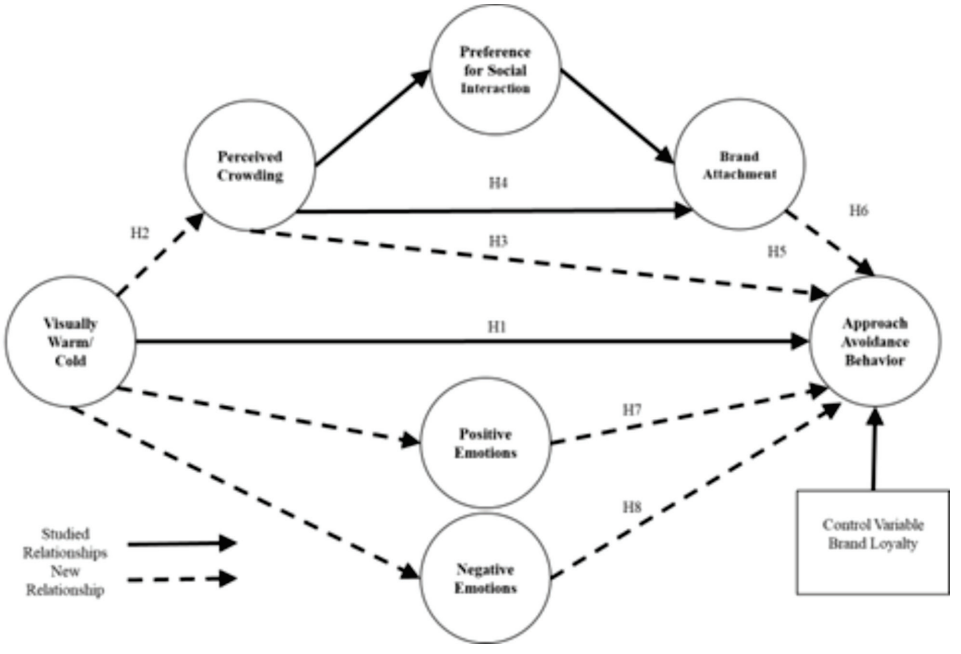

Figure 1: Conceptual Framework

allowing for the direct observation of subjects in their natural settings, enhancing the external validity or generalizability of the research findings and, therefore, being able to provide a better representation. Moreover, the approach enables causal conclusions to be drawn and verified, providing objective evidence of the ability, or lack thereof, of one or more factors to bring about changes in the desired outcomes (Kothari, 2004). Roe and Just (2009) and Shadish, Cook and Campbell (2002) discussed the merits of using natural settings in experimental conditions. According to them, if a researcher is able to conduct a study in a setting that is similar to or of direct interest with minimal disturbances, then the inferences drawn from such an experiment can be regarded as closer to the truth.

3.2. Sampling

In In line with the purposive sample strategy used, the unit of analysis for this study was individuals, and the target respondents were those who were either present within the required retail environment or had just exited the retail outlets after spending a certain amount of time in the outlet. According to Cohen, Manion and Morrison (2007), a sample size of at least 50 in experimental studies and around 100 samples for each major sub-group in the case of survey research is suitable. Using the sample size calculator developed by Soper (2019), a minimum sample size was estimated to be 119 based on a desired alpha level of 0.05, an effect size of 0.15, and a statistical

power level of 0.8. Keeping all these considerations in retrospect, the final sample size for this study was 204, gathered in Packages Mall, with at least 100 samples for both major groups pertaining to the warm and cold conditions.

Furthermore, post-hoc power analysis was conducted to determine the achieved power. In order to do so, we used the General Power Analysis program (Erdfelder, Faul, & Buchner, 1996), known as GPower, developed by Faul, Erdfelder, Buchner and Lang (2009). According to the results, a sample size of 100 for both groups was able to achieve the desired power level of 0.80, an alpha level of 0.05, and a medium effect size of 0.15 deemed acceptable by Hair, Black, Babin and Anderson (2013).

3.3. Pre-Test

In order to ensure the validity and reliability of the study, we conducted a pre-test on a small sample of respondents, consisting of customers in the actual store environment, representing our field population of interest. To achieve this, two common retail clothing brands, Khaadi and Sapphire, were used based on two criteria: first, they should be warm or cold-oriented on the temperature dimension based on characteristics prescribed by prior research, and second, the elements should be currently in use by retailers and such that retail managers would consider them to be commercially viable alternatives (Spangenberg, Sprott, Grohmann & Tracy, 2006). For visually warm store design, colors like bright red, orange, and yellow were used, and for cold conditions, blue, violet, and grey (Guéguen & Jacob, 2014). As for surface materials, bricks and wood would be used for warmth, and steel, marble, and glass as cold materials. All the other elements, such as store size, dimensions, product categories, and layout, were kept the same for both store conditions, as shown in Table 1.

Table 1: Retail Store Design

Variables	Khaadi	Sapphire
Store Location	Packages Mall (3rd Floor)	Packages Mall (3rd Floor)
Store Size	24,000 sq. feet	24,000 sq. feet
Store Timings	Sun-Fri (11 am – 11 pm)	Sun-Fri (11 am – 11 pm)
Product Categories	Clothing, Home, Accessories	Clothing, Home, Accessories
Target Market	SEC A and B	SEC A and B
No. of Sales personnel	12-14	12-14
Store Colors	Red, Yellow and Orange	Blue, Violet and White
Surface Material	Wooden Flooring	Marble Tiles
Wall Material	Brick (textured) walls	Matt (smooth surfaced) walls

Based upon these factors, Khaadi and Sapphire met both criteria. Khaadi is known for its visually warm design elements, with brightly painted walls in the colors of orange, yellow, and red, wooden flooring, and red brick walls. Whereas, the store design of Sapphire falls under the category of a visually cold store environment with its pale blue and violet color scheme, white marble tiles covering the floors, and plain white walls (see Image 1).

Image 1: Warm vs. Cold Retail Store Design

3.4. Field experiment design

As part of the experiment design, a real-store environment was used to test the hypotheses. To facilitate generalizability in the crowding conditions, data was collected intermittently during the experiment, in particular on the alternative weekdays and weekends at different time periods for both retail outlets in order to allow for crowd variations (Spangenberg et al., 2006). The participants in the field experiment were actual shoppers who were intercepted while they were present within the two stores or as they were exiting the stores. The respondents were approached regardless of evidence of shopping, age, or gender and were asked if they would be willing to fill out a brief questionnaire containing questions related to all the variables and basic demographic information. This particular method is in line with earlier studies in a similar context (Sherman et al., 1997; Li, Kim & Lee, 2009). Questions related to the manipulation checks were placed at the end of the questionnaire in order to mitigate the demand effects within the respondents when answering.

3.5. Instruments

Visual design elements were measured by three items adapted from Baek et al. (2018)'s study to gauge the warmth perception of the color of the walls, the material of the walls, and the surface of the floor on a 7-point semantic differential response scale. Feeling crowded was gauged by six items on the perceived retail crowding (PRC) scale introduced by Machleit, Kellaris and Eroglu (1994). Preference for Social Inter-

action was measured by three items adapted from the original 12 items of the Social Avoidance Scale developed by Burger (1995). In order to assess brand attachment, items were adapted from the scale introduced by Thomson, MacInnis and Park (2005). The original one-word items that depicted the nuances of brand attachment from the literature were adjusted in the form of clear and concise sentences to fit the context and purpose of this study on a 7-point semantic scale.

In order to assess "emotions", a retail-based emotions scale developed by Yoo et al. (1998) was used, and respondents were asked to indicate the extent to which they experienced these emotions on a seven-point Likert scale. As was the case with the brand attachment scale, this scale too was adapted and modified into sentence structure to increase respondents' clarity and understanding. For Approach-Avoidance behaviors, five item measures from Orth and Wirtz's (2014) adaptation and one item from Donovan and Rossiter's (1982) adaptation of the original Mehrabian and Russell (1974) scale were used. The control variable, brand loyalty, was measured using three items from Thomson et al. (2005) adaptation of the original items introduced by Sirgy, Johar and Samli (1991) on a 7-point semantic differential scale.

4. Results and Data Analysis

4.1. Pretest

A pre-test was performed in order to assess whether the two stores selected based on the design elements determined by previous studies successfully generated the perception of visual warmth (vs. cold) or not. It was a single factor: the visual warmth condition between subjects. The participants in the pre-test were the customers shopping in the two retail stores. 22 respondents participated in this study and were asked to rate the perception of store colors, walls, and surface material on a scale of 1 = cold and 7 = warm. A series of independent t-tests were performed for analysis of the various design elements, including color and material. The results confirmed the manipulation checks. Individuals shopping in the warm condition (Khaadi) perceived the color and material of the store to be significantly warmer than those in the cold condition (Sapphire).

4.2. Descriptive statistics

The demographic characteristics of respondents from both the visually warm and visually cold stores were relatively similar. According to the results reported in Table 2, it is primarily a female sample, as around 76% of the total respondents were female. This is not surprising considering both retail stores target market consists of female consumers. The age distribution in both instances was skewed to the younger

Table 2: Descriptive Statistics

Demographic Characteristics	Visually Warm (Khaadi)		Visually Cool (Sapphire)	
	Frequency	Percent	Frequency	Percent
Gender				
Male	25	24.3	21	20.2
Female	78	75.7	79	79.8
Age				
18-24 years	34	33	34	34
25-30 years	36	35	44	44
31-40 years	23	22.3	16	16
41-59 years	9	8.7	6	6
60 years and above	1	1		
Education				
Matriculation/O Levels	1	1		
Intermediate / A-Levels	13	12.6	2	2
Bachelors	59	57.3	71	71
Masters	30	29.1	27	27
Monthly Household Income				
Less than Rs. 25,000	4	3.9	3	3
Rs. 25,000 to Rs. 49,999	9	8.7	8	8
Rs. 50,000 – Rs. 99,999	45	43.7	50	50
Rs. 100,000 – Rs. 149,999	26	25.2	25	25
Rs. 150,000 and above	19	18.4	14	14

side, the majority of whom had completed at least 16 years of education and had a monthly income between PKR 50,000 and PKR 99,999.

4.3. Chi-square difference for multi-group analysis

To ensure that the two groups, warm and cold, are inherently different at the model and path levels, a test of chi-square difference was carried out. As shown in Table 3, using 'store' as the grouping variable and splitting the data along the values assigned to each store, it was found that the p-value is highly significant for the chi-square difference test and that the groups are not invariant, meaning that there is a difference between groups. (Gaskin, 2022).

4.4. Normality Tests

Tests for Skewness and kurtosis were carried out to establish the normality of the data for both the visually warm and visually cold models. Skewness measures the symmetry of the distribution with respect to the normal distribution. If the estimated values of skewness are within the range of -2 and +2 (George & Mallery, 2010), then normality of the data is established. Kurtosis refers to the presence of outliers in the distribution of data and is graphically represented by peak-ness or flatness of a distribution. Data with outliers depict large values of kurtosis and a peaked distribution, whereas, data without any outliers have low kurtosis and a flatter distribution. The desired range for kurtosis is of +7 and -7 (Hair,et al., 2013).The results from these tests indicate that all values were within the prescribed range; hence, there were no issues of normality.

4.5. Common Method Variance

Two different post hoc statistical tests for Common Method Variance were carried out to ensure that the measurement method did not cause the variations observed in the data, which may potentially inflate or deflate the observed relationships, limiting the validity of the inferences drawn from the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Results of Harman's single factor analysis showed that values for the visual warm and visual cold models were 25.18% and 27.84%, respectively, which are well below the prescribed 50% cutoff and provided evidence that common method variance was not present. Furthermore, a latent construct (CLF) was added to the hypothesized models. A comparison was made between the factor loadings of the base measurement model and the model with the latent construct; a difference of less than 0.2 showed the absence of CMV (Gaskin, 2022).

Table 3: Chi Square Difference

	Chi-Square	df	p-value	Invariant
Overall Model				
Unconstrained	232.243	21	0.000	
Fully constrained	464.239	33	0.000	
Number of groups		2		
Difference	231.996	12	0.000	NO

Note: df = degrees of freedom

4.6. Model fit analysis

In order to construct and evaluate the measurement model, a series of Confirmatory Factor analyses were performed using AMOS (Version 21) software. This was done primarily to gauge if the respondents were successful in distinguishing all constructs from one another in a hypothesized model. In order to achieve model fit, items with factor loadings below 0.5 were dropped from the model for each construct. After eliminating all items with low factor loadings, modification indices were considered to improve the model fit.

The study used multiple measures to evaluate the model's fit. "Normed Chi-square, or CMIN/df, was used to confirm the goodness of fit. Results showed that both models were well within the range of 1 to 3. Incremental fit indices, including IFI and CFI values, were computed and found to be above the prescribed standard of 0.9, and hence the model fit was confirmed for both models. Reliability and validity analyses were conducted for both models. The results for both revealed that the data met Fornell and Larcker's (1981) prescribed thresholds. The construct reliability (CR) for all variables is above 0.7, the AVE values above 0.5 confirmed the convergent validity, and the values for MSV less than AVE confirmed discriminant validity for all eight proposed constructs.

4.7.Bivariate analysis

Visual warmth has a strong positive relationship with crowding ($r = 0.606$, $p < 0.01$) and approach/avoidance behavior ($r = 0.639$, $p < 0.01$), respectively. In the case of crowding, it has a significant and strong positive relationship with brand attachment ($r = 0.563$, $p < 0.01$) and approach/avoidance behavior ($r = 0.756$, $p < 0.01$). Positive emotions have a strong positive correlation with approach or avoidance behavior ($r = 0.621$, $p < 0.01$), whereas negative emotions have a weak positive correlation of 0.120. Moreover, as we had conjectured, visual cold design has an insignificant and weak relationship with crowding ($r = 0.053$). While brand attachment has a strong positive relationship with positive emotions ($r = 0.587$, $p < 0.01$), Moreover, approach/avoidance behavior has a strong positive relationship with positive emotions ($r = 0.641$, $p < 0.01$).

4.8. Hypothesis testing

4.8.1. Visually warm model

Hypothesis 1 stated that a visually warm store design will increase the desired approach behavior in consumers, and the results of the analysis were found to have a statistically significant and positive beta value ($\beta = 0.528$, $p < 0.01$), lending support

Table 4: Regression Analysis with Control Variable (Brand Loyalty)

Variable(s)	Dependent Variable	Approach – Avoidance Behaviour	
		Step 1	Step 2
Control Variable			
Brand Loyalty		0.241**	.194
Independent Variables			
Visual Warmth			0.528***
R2		0.046	0.438
F		4.817**	38.968***
ΔR2	-		0.392

Note: R2 = R-Square, F = F statistic and ΔR2 = Change in R2

** p < 0.05, *** p <0.01

to our first hypothesis. Moreover, after controlling for the effect of Brand Loyalty, the effect is still statistically significant, as shown in Table 4. Hypothesis 2 states that the visually warm store design will significantly increase the perception of feeling crowded. Results reported in Table 5 show that, as hypothesized, visually warm design elements will significantly increase the perception of feeling crowded ($\beta = 0.636$, $p < 0.01$), and results offer strong support for this claim. Hypothesis 3 analyzed the effect of perceived crowding on brand attachment, and the results show that perceived crowding will significantly increase brand attachment ($\beta = 0.424$, $p < 0.01$) in consumers.

Table 5: Path Structural Coefficients: Model 1

Direct Effect/Path	Coefficient	t-value	Confidence Interval	R-square
Visual Warmth → Feeling Crowded (a1)	.636**	7.569	[.4693; .8027]	0.372
Visual Warmth → Positive Emotions (a2)	.252**	3.202	[.0959;.4081]	0.208
Visual Warmth → Negative Emotions (a3)	.099	1.535	[-.029;.227]	0.058
Feeling Crowded → Approach-Avoidance Behaviour (b1)	.252**	3.983	[.1266;.3781]	0.740
Brand Approach-Avoidance Attachment → Behaviour (b2)	.239**	3.533	[.1048;.3733]	
Positive Emotions → Approach-Avoidance Behaviour (b3)	.267**	4.121	[.1388;.3967]	

Negative Emotions → Approach-Avoidance Behaviour (b4)	.012	.1686	[-.1347;.1598]	
Visual Warmth → Approach-Avoidance Behaviour (ć)	.236**	4.188	[.1242;.3480]	

Note: ** = p-value <0.01, * = p-value < 0.05

The results of the mediation analysis are shown in Table 6. Hypothesis 4 sought to test feeling crowding as the mediator between visual warmth and approach-avoidance behavior. Results of the data analysis show that the direct effect of visual warmth on approach-avoidance behavior is significant (β = 0.2361, p < 0.01), and the indirect effect of visual warmth on approach-avoidance behavior through feeling crowded is statistically significant (Indirect Effect = 0.1605, Boot CI [.0642,.2733]), lending support to a mediating effect as reported in Table 6. Hypothesis 5 aimed to investigate whether the effect of a visually warm store design on approach-avoidance behavior is mediated by feeling crowded and brand attachment or not. The direct effect of visual warmth on approach-avoidance behavior is significant (β = 0.2361, p < 0.01) in Table 4, and the mediation results showed a significant positive indirect effect (= 0.646, Boot CI [.017,.1294]) reported in Table 6.

Table 6: Indirect Path Coefficients: Model 1

Indirect Effects of Visual Warmth via mediators (individually and in a sequence)		**Point Estimate**	**Confidence Interval**
(via Feeling Crowded)			
a1 = .636		.1605	[.0642 .2733]
b1 = .252			Significant
(a1* b2) = .1605			
(via Positive Emotions)			
a2 = .252		.0675	.0139 .1645
b3 = .267			[Significant]
a2 * b3 = .0675			
(via Negative Emotions)			
a3 = .099		.0012	-.0177 .0228
b4 = .012			[Insignificant]
a3 * b4 = .0012			
(via Feeling Crowded and Brand Attachment)			
a1 = .636		.0646	.0177 .1294
d31 = .424			[Significant]

b1 = .252			
a1*d31*b1 = .0646			
(via Feeling Crowded, Preference for Social Interaction and Brand Attachment)			
a1 = .636		-.0002	-.0075 .0049
d21 = -.123			[Insignificant]
d32 = .421			
b2 = .239			
a1 * d21 *d32*b2 = -.0002			
Total Indirect Effect			
(a1* b2) + (a3 * b3) + (a32 * b4) + (a1*d31*b1) + (a1 * d21 *d32*b2) = .2936		.2936	.1917 .4203 [Significant]
Direct Effect of Visual Warmth on Approach-Avoidance Behaviour (ć)		.2361	.1242 .3480 [Significant]
Total Effect of Visual Warmth on Approach-Avoidance Behaviour			
Total Indirect Effect + Direct Effect 0.2936 + 0.2361 = 0.5297		0.5297	t-value 8.357 p-value 0.000
Direct Effect of Visual Warmth on Approach-Avoidance Behaviour (c)		0.5283	

Hypothesis 6 attempted to determine if the effect of a visually warm store design on approach-avoidance behavior is mediated by feeling crowded, preference for social interaction, and brand attachment or not. The direct effect of visual warmth on approach-avoidance behavior is significant ($\beta = 0.2361$, $p < 0.01$), and the indirect path analysis results showed the indirect effect was statistically insignificant (Indirect Effect = -0.0002, Boot CI [-.0075,.0049]). Hypothesis 7 attempted to determine whether the effect of a visually warm store design on approach-avoidance behavior is mediated by positive emotions or not. It was found that visual warmth is a significant predictor of positive emotions ($\beta = 0.252$, $p < 0.01$), and positive emotions significantly increase the desired approach behavior in consumers ($\beta = 0.267$, $p < 0.01$) and the direct effect of visual warmth on approach avoidance ($\beta = 0.2361$, $p < 0.01$).

Hypothesis 8 sought to assess in the final serial mediation test whether the effect of visually warm store design on approach-avoidance behavior is mediated by negative emotions or not. The direct effect of visual warmth on approach-avoidance behavior is significant ($\beta = 0.2361$, $p < 0.01$), and the indirect effect of visual warmth on approach-avoidance mediated by negative emotions is statistically insignificant (Indirect Effect = 0.0012, Boot CI [-.0177,.0228]). Zhao, Lynch, and Chen (2010) identified

three different forms of mediation: complementary, competitive, and indirect only mediation. Based upon this, we can conclude that mediation via perceived crowding, positive emotions, and brand attachment is complementary in nature, as both the direct and mediated effects were significant and positive.

4.8.2.Visually cold model

Table 7: Path Structural Coefficients: Model 2

Direct Effect/ Path	Coefficient	t-value	Confidence Interval	R-square
Visual Cold → Perceived Crowding (a1)	.123	1.000	[-.1214, .3681]	0.0525
Visual Cold → Positive Emotions (a2)	.058	.5411	[-.1560,.2728]	0.1812
Visual Cold → Negative Emotions (a3)	.061	.5355	[-.1673,.2909]	0.0911
Feeling Crowded → Approach-Avoidance Behaviour (b1)	.252**	3.640	[.1148, .3902]	0.6096
Brand Attachment → Approach-Avoidance Behaviour (b2)	.460**	4.221	[.2438, .6767]	
Positive Emotions → Approach-Avoidance Behaviour (b3)	.551**	6.790	[.3905, .7133]	
Negative Emotions → Approach-Avoidance Behaviour (b4)	.512**	6.240	[.3497, .6760]	
Visual Cold → Approach-Avoidance Behaviour (ć)	-.194**	-2.468	[-.3500, -.0380]	

Note: ** = p-value <0.01, * = p-value < 0.05

Hypothesis 1 stated that a visually cold store design as opposed to a visually warm store will decrease the desired approach behavior in consumers based on the statistically significant and negative beta value (β = -0.0602, $p < 0.01$) as reported in Table 7. Hypothesis 2 states that the visually cold store design will significantly increase the perception of feeling crowded. Results of the analysis showed that a visually cold store design does not significantly increase the perception of feeling crowded (β = 0.123, $p > 0.05$). Hypothesis 3 sought to analyze the effect of perceived crowding on brand attachment, and the results show that feeling crowded in a visually cold environment as opposed to a visually warm environment did not significantly increase brand attachment (β = 0.108, $p > 0.05$) in consumers, as shown in Table 7.

Hypothesis 4 sought to test feeling crowding as the mediator between visual cold and approach-avoidance behavior. Results of the analysis showed that the direct effect of visual cool on approach-avoidance behavior is significant (β = 0.2361, $p < 0.01$) and the indirect effect of visual cool on approach-avoidance behavior through feeling crowded is statistically insignificant (Indirect Effect = 0.0311, Boot CI [-.0261,.1055]) reported in Table 8. Hypothesis 5 sought to find out whether the effect of a visually cold store design on approach-avoidance behavior is mediated by feeling crowded and brand attachment. The direct effect of visual cold on approach-avoidance behavior is significant (β = -0.194, $p < 0.01$), and the mediation results found an insignificant positive indirect effect = 0.0062, Boot CI [-.0072,.0286]. Hypothesis 6 attempted to determine if the effect of a visually cool store design on approach-avoidance behavior is mediated by feeling crowded, preference for social interaction, and brand attachment or not. The direct effect of visual cold on approach-avoidance behavior is significant (β = -0.194, $p < 0.01$), and the indirect path analysis results in Table 4.31 show the indirect effect to be statistically insignificant (Indirect Effect = 0.0010, Boot CI [-.0016,.0053]). Hypothesis 7 aimed to determine whether the effect of a visually cool store design on approach-avoidance behavior is mediated by positive emotions or not. Visual cold is not a significant predictor for positive emotions (β = 0.058, $p > 0.05$), whereas positive emotions significantly increase the desired approach behavior in consumers (β = 0.551, $p < 0.01$) and the direct effect of visual cold on approach-avoidance behavior (β = -0.194, $p < 0.01$). Hypothesis 8 sought to assess in the final serial mediation test whether the effect of visually cold store design on approach-avoidance behavior is mediated by negative emotions or not. The direct effect of visual cold on approach-avoidance behavior is significant (β = -0.1940, $p < 0.01$), whereas the indirect effect is statistically insignificant (Indirect Effect = 0.0312, Boot CI [-.1006,.1738]). Mediation analysis results are shown in Table 8.

Table 8: Indirect Path Coefficients: Model 2

Indirect Effects of Visual Cold via mediators (individually and in a sequence)		Point Estimate	Confidence Interval
(via Perceived Crowding)			
a1 = .123	(a1* b2) = .0311	.0311	[-.0261, .1055] Insignificant
b1 = .252			
(via Positive Emotions)			
a2 = .058	a2 * b3 = .0323	.0323	[-.0805, .1538] Insignificant
b3 = .551			
(via Negative Emotions)			
a3 = .061	a3 * b4 = .0317	.0317	[-.1006, .1738] Insignificant
b4 = .512			
(via Feeling Crowded and Brand Attachment)			
a1 = .123	a1*d31*b1 = .0062	.0062	[-.0072, .0286] Insignificant
d31 = .108			
b2 = .460			
(via Crowding, Preference for Social Interaction and Brand Attachment)			
a1 = .123	a1 * d21 *d32*b2 = .0010	.0010	[-.0016, .0053] Insignificant
d21 = -.067			
d32 = .261			
b2 = .460			
Total Indirect Effect			
(a1* b2) + (a3 * b3) + (a32 * b4) + (a1*d31*b1) + (a1 * d21 *d32*b2) = .1023		.1023	[-.0413, .2685] Insignificant
Direct Effect of Visual Cold on Approach-Avoidance Behaviour (ć)		-.1940	[.1242 .3480] Significant
Total Effect of Visual Cold on Approach-Avoidance Behaviour Total Indirect Effect + Direct Effect 0.1023 + (-.1940) = -0.09		-0.09	t-value -2.468
Direct Effect of Cold on Approach-Avoidance Behaviour (c)		-0.06	

5. Discussion

The key objective of this study was to understand the intricacies and nuances consumers' exhibit when exposed to visually warm and cold conditions by leveraging the renewed interest in grounded cognition theory. Grounded cognition theory propagates the idea that concrete experiences (such as temperature) are grounded in abstract concepts (positive feelings) with which they are experienced. When people view an image of a fireplace, the stored associations related to it of feeling warm, comfort, and relaxation will get triggered; hence, the feeling of warmth manifests itself without there being an actual change in physical warmth (Macrae, Raj, Best, Christian, & Miles, 2013; Baek et al. 2018). In Ijzerman & Semin (2009)'s research, they demonstrated the presence of a bi-directional relationship between warmth and social proximity, between feeling cold and feeling lonely.

This interplay of these variables is even more significant as previous studies show that not much work had been done prior to this research in terms of understanding the underlying contrivances of visual warmth. The current literature suffers from an inherent bias towards only studying specific design elements like color, scent, music, and temperature and their impact on consumers' approach behaviors and emotions, and highlights only the negative consequences of crowding. Therefore, visual warmth (vs. cold), feeling crowded, preference for social interaction, brand attachment as an alternative to social connectedness, positive and negative emotions, and approach/avoidance behavior of consumers were examined as an integrated framework.

The results of the study highlight the contrast between the visually warm and visually cool store designs. Visually warm store design was found to increase approach behaviors, while visually cold store design was found to mitigate them. These results align with extant literature, which states that environmental stimuli like warm and highly saturated colors and other associated visual elements have been found to produce more engaged, aroused, and excited responses from individuals, which in turn leads to increased approach behaviors when compared to cold, less saturated colors and visual elements (Roschk, Loureiro & Breitsohl, 2017; Wang et al., 2019). The Stimulus-organization-Response model provides the foundation for the explanation of these findings; visual store design elements serve as the stimuli that lead to cognitive and affective responses (warm colors leading to excitement and engagement and cold colors leading to calm and disinterest), which in turn lead to approach behaviors such as buying intentions (Ayad & Benhabib, 2016; Tantanatewin & Inkarojrit, 2018), as has been exhibited by the current research.

The effect of visually warm store design was found to have a significant impact on increasing the perception of being crowded; in direct contrast to this, visually cold

design was not found to significantly influence perceived crowding. This is in line with past literature, which has found that warm ambient factors like smells can create an increase in perceived temperature, leading to an increase in perceived crowding in spite of no change in actual physical proximity, while cold ambient factors do not exhibit these effects to a comparable degree (Madzharov et al., 2014; Zwebner et al., 2013). The theoretical foundation of these particular results can be linked to the Grounded Cognition Theory. The theory presents the notion that tangible experiences (such as temperature) are grounded in abstract concepts (positive feelings) with which they are experienced (Barsalou, 2008), which can be further extended to how consumers evaluate space, products, and brands. (Baek et al., 2018).

For the visually warm model, feeling crowded created an increase in brand attachment, while the visually cold model did not create any significant brand attachment. Additionally, the mediation analysis carried out in the visually warm model showed that variables such as perceived crowding, brand attachment, and positive and negative emotions did mediate the relation between visually warm store design and approach-avoidance behaviors; however, the visually cold model did not show any mediation effect. Taking into account that literature shows that ambient factors such as visual elements lead to affective responses (Tran, 2020), these results are easily explainable. In order to deal with these affective responses (both positive and negative) that shift consumers' perception of perceived control over a situation, they choose to form attachments to brands as a means to reestablish control over a given scenario, which is reflected in the results of this study. Each of the proposed mediation variables can further be said to be either the source of these responses (perceived crowdedness, positive and negative emotions) or play a role in amplifying their effect (brand attachment), ultimately leading to desired approach behaviors (Almeida et al., 2019; Madzharov et al., 2014; Singla & Gupta, 2019; Tang & Zhang, 2020; Zhao & Guan, 2023). The lack of influence seen in the visually cold model may be explained by the fact that low-saturation, cold visual elements do not generate the same degree of emotional responses (Wang et al., 2019), meaning the likelihood of forming a brand is significantly reduced.

5.1. Theoretical contributions

Although Although some studies prior to this have explored and sought to explain the relationship between social warmth and physical warmth and the effect of visually warm colors independently (Fenko et al., 2010; Mehta et al., 2011) and the positive outcomes of crowding (Andrews et al., 2015), However, no research has been done to date in order to study these variables of visual warmth in conjunction with perceived crowding. Therefore, it was interesting to discover how these two variables, when in

congruence, augmented the proposed relationships and the effect when they were not in accord with each other.

The most important concept in this study was to establish newfound antecedents and consequences of feeling crowded. Feeling crowded is defined as the state in which individuals experience a space to be more crowded and limited than it actually is and feel decreased levels of perceived control over their social environment due to seemingly high social density (Stokols, 1972; Eroglu & Machleit, 1990). In business literature, negative responses have always been consistently highlighted as the 'only outcome, and as such, they have been used to define the consequences of crowding. Hence, a negative relationship between crowding and consumer behavior dominates the studies till date, with the exception of a few, including Tse, Sin and Yim (2002), Pons, Laroche and Mourali (2006), and Huang et al. (2018), which are beginning to question this presumption of a negative response as the only rationale for crowding and are hinting towards a positive outcome as well.

However, interestingly enough, feeling crowded is a psychological construct. Therefore, whether an individual perceives a space to be crowded or not depends upon various spatial, individual, social, and situational factors, and as such, his or her response to it can also differ (Whiting & Nakos, 2008). In line with these findings, we believed that the feeling of crowdedness in consumers can be successfully manipulated to a certain extent by altering certain environmental and architectural elements related to visual warmth in a retail setting to generate the desired positive consumer behavior.

The study compared two retail stores, Khaadi (visually warm) and Sapphire (visually cold), to bring to light how visual elements impact approach-avoidance behaviors. The visually warm retail environment was observed to have a significant impact on perceived crowding, with respondents reporting higher perceived crowding levels; this particular finding is in line with grounded cognition theory and Ijzerman and Semin (2009)'s study, effectively confirming visually warm environments as an antecedent to perceived crowding. The second aspect of this study was related to establishing positive outcomes from crowding. As respondents felt increased levels of perceived social density and their personal space threatened, they indulged in positive power compensatory behaviors to reassert their control, lowering the need for social interaction with others and using brands as an alternative to social connectedness. The study also led to the observation that in visually warm retail environments, consumers displayed increased brand attachment, subsequently leading to heightened approach behaviors. Consumers were observed to have a discernible liking for the visually warm environment and wanted to spend more time browsing the store, and they considered it a place where they would likely end up spending more money than

they had originally planned.

Individuals have an inherent need for belongingness; thus, when they find themselves in situations where engaging in social interaction is not possible, they satisfy that particular need by developing an attachment to objects, which in this case is the retail brand and its products. In our study, we observed that in cases where the store environment was visually warm, consumers displayed increased brand attachment and were witnessed to be highly engrossed with the products in Khaadi, leading to heightened approach behaviors. Consumers were observed to have a discernible liking for the Khaadi (visually warm) environment and wanted to spend more time browsing the store, and they considered it a place where they would likely end up spending more money than they had originally planned.

The second part of the model was an extension of environmental psychology's S-O-R (Stimulus Organism Response) model developed by Mehrabian and Russell (1974), with visual warmth as the stimuli, positive and negative emotions as organisms, and approach-avoidance behavior as the response. Findings of the study showed that positive emotions were associated more with the warm environment, as warm colors and materials have been previously found to generate both physical warmth and emotional warmth as compared to the visually cold environment. This particular finding is in line with the earlier studies, as "warm", has always been considered to be more welcoming and results in eliciting positive judgments and compatible feelings about the person or the place in question (Williams & Bargh, 2008; Bargh & Shalev, 2012; Baek et al., 2018). The visually cold store environment, on the other hand, did not have a significant impact on perceived crowding, brand attachment, or emotions. In fact, as opposed to a visually warm retail design, the visually cold design had a significant but negative relationship with the desired approach behaviors of the consumers.

5.2. Practical implications

These findings have significant practical implications. Retail atmospherics are continuously evolving, and an increased emphasis on creating situational involvement on the consumers' end is apparent. Retail and brand managers are now hard pressed to develop immersive retail experiences for their consumers, and it is no longer an option but rather has transgressed into the realm of a necessity. Store interior design is a major tool that can be used to manipulate desired approach behaviors in consumers and can also increase store patronage intentions in the form of increased consumer preference for premium brands, a greater amount of money spent on premium or luxury products, an increased number of total purchased products (Madzharov et al., 2014), an enhanced store image (Tse et al., 2002), and displaying confidence in the choice of retail outlet (Eroglu & Machleit, 1990). Therefore, elements such as warm

or cool wall colors, wooden or marble flooring, and textured brick or smooth-surfaced walls are something every retailer can potentially utilize in order to create a certain environment for its consumers.

5.3. Limitations and future research directions

Despite its theoretical and practical contributions, this study has some limitations that should be addressed by future research. First, the scenario and stimuli used were more female-oriented, even though both men and women participated. The two retail stores have more female shoppers, and the product categories, brand, and store design are female-oriented. Therefore, the sample was primarily female. As a result, the study was unable to identify or explore the gender-related difference and had to remove the variable from the main study. Therefore, it is suggested that future exploration with a gender-specific design or context may prove meaningful. Moreover, it was a quasi-experiment that could not control for covariates apart from brand loyalty; therefore, it is proposed that future studies may control for variables such as sales representatives' behavior, product categories displayed, promotion and marketing campaigns, and the spatial assortment of the furniture and display shelves in stores. Lastly, future research can provide generalizability by replicating the same experiment in different contexts in terms of product category or brand.

References

Aaker, D. A., Stayman, D. M., & Hagerty, M. R. (1986). Warmth in advertising: measurement, impact, and sequence effects. *Journal of Consumer Research*, *12*(4), 365-381. https://doi.org/10.1086/208524

Alawadhi, A., & Yoon, S. (2016). Shopping behavioral intentions contributed by store layout and perceived crowding: an exploratory study using computer Walk-Through simulation. *Journal of Interior Design*, *41*(4), 29–46. https://doi.org/10.1111/joid.12077

Almeida, C. P., Botelho, D., & Pereira, I. (2019). A field study on the relationship between perceived store crowding and consumer response. *International Journal of Business Marketing, 4*(1), 36–45. https://ijbmkt.emnuvens.com.br/ijbmkt/article/view/106/113

Andrews, M., Luo, X., Fang, Z., & Ghose, A. (2015). Mobile ad effectiveness: hyper-contextual targeting with crowdedness. *Marketing Science*, *35*(2), 218–233. https://doi.org/10.1287/mksc.2015.0905

Ayad, S., & Benhabib, A. (2016). The role of color in the attainment of customers' intensive buying intention: an exploratory descriptive case study S.O.R model application. *International Journal of Innovation and Applied Studies*, *16*(1), 173–182. https://doi.org/10.37136/0504-000-019-017

Badrinarayanan, V., & Becerra, E. (2019). Shoppers' attachment with retail stores: Antecedents and impact on patronage intentions. *Journal of Retailing and Consumer Services*, *50*, 371–378. https://

doi.org/10.1016/j.jretconser.2018.07.012

Baek, E., Choo, H. J., Oh, H., & Yoon, S. (2018). How consumers "see" a visually warm store: Differences between affective and cognitive processors. *Journal of Consumer Behaviour*, *17*(2), 149–160. https://doi.org/10.1002/cb.1698

Baker, J., Bentley, K., & Lamb, C. W. (2020). Service environment research opportunities. *Journal of Services Marketing*, *34*(3), 335–346. https://doi.org/10.1108/jsm-02-2019-0077

Bargh, J. A., & Shalev, I. (2012). The substitutability of physical and social warmth in daily life. *Emotion*, *12*(1), 154–162. https://doi.org/10.1037/a0023527

Barsalou, L. W. (2008). Grounded cognition. *Annual Review of Psychology*, *59*(1), 617–645. https://doi.org/10.1146/annurev.psych.59.103006.093639

Bijandi, Sadeghi, T., & Fereshteh. (2011). The effect of shopping mall environment on shopping behavior under a model. *Middle-East Journal of Scientific Research*, *8*(3): 566-574.

Bitner, M. J. (1992). Servicescapes: the impact of physical surroundings on customers and employees. *Journal of Marketing*, *56*(2), 57. https://doi.org/10.2307/1252042

Blut, M., & Iyer, G. R. (2020). Consequences of perceived crowding: a meta-analytical perspective. *Journal of Retailing*, *96*(3), 362–382. https://doi.org/10.1016/j.jretai.2019.11.007

Boutsouki, C. (2019). Impulse behavior in economic crisis: a data driven market segmentation. *International Journal of Retail & Distribution Management*, *47*(9), 974–996. https://doi.org/10.1108/ijrdm-08-2018-0165

Burger, J. M. (1995). Individual differences in preference for solitude. *Journal of Research in Personality*, *29*(1), 85–108. https://doi.org/10.1006/jrpe.1995.1005

Chatzopoulou, E., Tsogas, M. M., & Kyriakou, M. (2021). Retail atmospherics in times of disruption: a PLS modeling approach of the role of emotions in a pharmacy environment. *International Journal of Retail & Distribution Management*, *50*(2), 158–182. https://doi.org/10.1108/ijrdm-04-2021-0208

Choi, J., Chang, Y. K., Kil-Jae, L., & Chang, J. D. (2016). Effect of perceived warmth on positive judgment. *Journal of Consumer Marketing*, *33*(4), 235–244. https://doi.org/10.1108/jcm-02-2015-1309

Choudhary, F. S., & Sharma, A. (2018). Mediating role of analysis of affective state for generating consumer response towards visual merchandising in online context. *Researcher: A Multidisciplinary Journal*, *XIV*(2), 134–150.

Cohen, L., Manion, L., & Morrison, K. (2007). Research methods in education. In *Routledge eBooks* (6th Ed.). https://doi.org/10.4324/9780203029053

Coşgun, B., Yildirim, K., & Hidayetoğlu, M. L. (2021). Effect of wall covering materials on the perception of cafe environments. *Facilities*, *40*(3/4), 214–232. https://doi.org/10.1108/f-07-2021-0060

De Oliveira, S. F., Ladeira, W. J., Sampaio, C. H., & Perin, M. G. (2020). Effects of perceived retail crowding: a meta-analytic study. *The International Review of Retail, Distribution and Consumer Research*, *30*(4), 411–436. https://doi.org/10.1080/09593969.2020.1738259

Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: an environmental psychology approach. *Journal of Retailing*, *58*(1), 34-57 https://www.researchgate.net/profile/Robert-Donovan-2/publication/248766608_Store_Atmosphere_An_Environmental_Psychology_Approach/links/5a38c3ef0f7e9b7c48700249/Store-Atmosphere-An-Environmental-Psychology-Approach.pdf

Donovan, R. J., Rossiter, J. R., Marcoolyn, G., & Nesdale, A. (1994). Store atmosphere and purchasing behavior. *Journal of Retailing*, *70*(3), 283–294. https://doi.org/10.1016/0022-4359(94)90037-x

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods Instruments & Computers*, *28*(1), 1–11. https://doi.org/10.3758/bf03203630

Eroglu, S. A., & Machleit, K. A. (1990). An Empirical Study of Retail Crowding: Antecedents and Consequences. *Journal of Retailing*, *66*(2), 201–221.

Escobar, F. B., Velasco, C., Byrne, D. V., & Wang, Q. J. (2022). Crossmodal associations between visual textures and temperature concepts. *Quarterly Journal of Experimental Psychology*, *76*(4), 731–761. https://doi.org/10.1177/17470218221096452

Evans, G. W., & Wener, R. (2007). Crowding and personal space invasion on the train: Please don't make me sit in the middle. *Journal of Environmental Psychology*, *27*(1), 90–94. https://doi.org/10.1016/j.jenvp.2006.10.002

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/brm.41.4.1149

Fenko, A., Schifferstein, H. N., & Hekkert, P. (2010). Looking hot or feeling hot: What determines the product experience of warmth? *Materials in Engineering*, *31*(3), 1325–1331. https://doi.org/10.1016/j.matdes.2009.09.008

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2006). Universal dimensions of social cognition: warmth and competence. *Trends in Cognitive Sciences*, *11*(2), 77–83. https://doi.org/10.1016/j.tics.2006.11.005

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Fournier, S. (1998). Consumers and their Brands: Developing relationship theory in consumer research. *Journal of Consumer Research*, *24*(4), 343–353. https://doi.org/10.1086/209515

Gaskin, J. (2022). Causal Models - *Gaskination StatWiki*. http://statwiki.gaskination.com/index.php?title=Causal_Models

George, D., & Mallery, P. (2010). *SPSS for Windows Step-by-Step: A Simple Guide and Reference, 17.0 update* (10th Ed.). http://ci.nii.ac.jp/ncid/BA81875618

Guéguen, N., & Jacob, C. (2014). Coffee cup color and evaluation of a beverage's "warmth quality." *Color Research and Application*, *39*(1), 79–81. https://doi.org/10.1002/col.21757

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). Multivariate Data Analysis. In *Pearson eBooks* (10th Ed.). https://ci.nii.ac.jp/ncid/BB03463866

Hidayetoglu, M. L., Yildirim, K., & Akalin, A. (2012). The effects of color and light on indoor wayfinding and the evaluation of the perceived environment. *Journal of Environmental Psychology, 58*, 50-58. https://doi.org/10.1016/j.jenvp.2011.09.001

Huang, X., Huang, Z., & Wyer, R. S. (2018). The influence of social crowding on brand attachment. *Journal of Consumer Research*, *44*(5), 1068–1084. https://doi.org/10.1093/jcr/ucx087

Hui, M. K., & Bateson, J. (1991). Perceived control and the effects of crowding and consumer choice on the service experience. *Journal of Consumer Research*, *18*(2), 174. https://doi.org/10.1086/209250

IJzerman, H., & Semin, G. R. (2009). The thermometer of social relations. *Psychological Science*, *20*(10), 1214–1220. https://doi.org/10.1111/j.1467-9280.2009.02434.x

IJzerman, H., & Semin, G. R. (2010). Temperature perceptions as a ground for social proximity. *Journal of Experimental Social Psychology*, *46*(6), 867–873. https://doi.org/10.1016/j.jesp.2010.07.015

Itten, J., Birren, F., & Van Hagen, E. (1970). The elements of color : a treatise on the color system of Johannes Itten, based on his book the art of color. In *Van Nostrand Reinhold eBooks*. http://ci.nii.ac.jp/ncid/BA33001705

Jha, S., Balaji, Peck, J., Oakley, J., & Deitz, G. D. (2020). The effects of environmental haptic cues on consumer perceptions of retailer warmth and competence. *Journal of Retailing*, *96*(4), 590–605. https://doi.org/10.1016/j.jretai.2020.04.003

Kothari, C. (2004). *Research methodology: Methods and techniques*. https://ndl.ethernet.edu.et/bitstream/123456789/88770/1/2004%20Kothari_%20Research%20Methodology%20Methods%20and%20Techniques.pdf

Kotler, P. (1973). Atmospherics as a marketing tool. *Journal of Retailing*, *49*, 48–64. https://www.scholars.northwestern.edu/en/publications/atmospherics-as-a-marketing-tool

Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology*, *22*(3), 332–351. https://doi.org/10.1016/j.jcps.2011.08.003

Kumar, A., & Kim, Y. (2014). The store-as-a-brand strategy: The effect of store environment on customer responses. *Journal of Retailing and Consumer Services*, *21*(5), 685–695. https://doi.org/10.1016/j.jretconser.2014.04.008

Li, J. T., Kim, J., & Lee, S. Y. (2009). An empirical examination of perceived retail crowding, emotions, and retail outcomes. *The Service Industries Journal*, *29*(5), 635–652. https://doi.org/10.1080/02642060902720121

Lin, I. Y. (2004). Evaluating a services cape: the effect of cognition and emotion. *International Journal of Hospitality Management*, *23*(2), 163–178. https://doi.org/10.1016/j.ijhm.2003.01.001

Lin, I. Y., & Worthley, R. (2012). Servicescape moderation on personality traits, emotions, satisfaction, and behaviors. *International Journal of Hospitality Management*, *31*(1), 31–42. https://doi.org/10.1016/j.ijhm.2011.05.009

Lin, J., Zhou, Z., & Leckie, C. (2020). Green brand communication, brand prominence and self–brand connection. *Journal of Product & Brand Management*, *30*(8), 1148–1161. https://doi.org/10.1108/jpbm-04-2020-2874

Lyu, J., Krasonikolakis, I., & Vrontis, D. (2022). A systematic literature review of store atmosphere in alternative retail commerce channels. *Journal of Business Research*, *153*, 412–427. https://doi.org/10.1016/j.jbusres.2022.08.050

Machleit, K. A., Eroglu, S., & Mantel, S. P. (2000). Perceived retail crowding and shopping satisfaction: What modifies this relationship? *Journal of Consumer Psychology*, *9*(1), 29–42. https://doi.org/10.1207/s15327663jcp0901_3

Machleit, K. A., Kellaris, J. J., & Eroglu, S. (1994). Human versus spatial dimensions of crowding perceptions in retail environments: A note on their measurement and effect on shopper satisfaction. *Marketing Letters*, *5*(2), 183–194. https://doi.org/10.1007/bf00994108

Macrae, C. N., Raj, R. S., Best, S. B., Christian, B. M., & Miles, L. K. (2013). Imagined sensory experiences can shape person perception: It's a matter of visual perspective. *Journal of Experimental Social Psychology*, *49*, 595–598. https://doi.org/10.1016/j.jesp.2012.10.002

Madzharov, A. V., Block, L., & Morrin, M. (2014). The Cool Scent of Power: Effects of ambient scent on consumer preferences and choice behavior. *Journal of Marketing*, *79*(1), 83–96. https://doi.org/10.1509/jm.13.0263

Malär, L., Krohmer, H., Hoyer, W. D., & Nyffenegger, B. (2011). Emotional brand attachment and brand personality: the relative importance of the actual and the ideal self. *Journal of Marketing*, *75*(4), 35–52. https://doi.org/10.1509/jmkg.75.4.35

Mari, M., & Poggesi, S. (2013). Servicescape cues and customer behavior: a systematic literature review and research agenda. *The Services Industries Journal*, *33*(2), 171–199. https://doi.org/10.1080/02642069.2011.613934

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. http://ci.nii.ac.jp/ncid/BA0718977X?l=en

Mehta, R., Chae, B., Zhu, R., & Soman, D. (2011). Warm Or Cool Color? Exploring the Effects of

Color on Donation Behavior. *ACR North American Advances*. https://www.acrwebsite.org/volumes/v39/acr_v39_9942.pdf

Meyers-Levy, J., & Zhu, R. (2007). The influence of ceiling height: the effect of priming on the type of processing that people use. *Journal of Consumer Research*, *34*(2), 174–186. https://doi.org/10.1086/519146

Ndengane, R. M., Mason, R., & Mutize, M. (2021). The influence of store atmospherics on customers' satisfaction at selected South African retail outlets. *Innovative Marketing*, *17*(1), 26–39. https://doi.org/10.21511/im.17(1).2021.03

Nguyen, T. H. G., & Nham, P. T. (2022). The influence of social, design and ambient factors of store environment on customer perceptions and behavioral intentions. *The Journal of Behavioral Science*, *17*(1), 27–42. https://so06.tci-thaijo.org/index.php/IJBS/article/view/254131

Orth, U. R., & Wirtz, J. (2014). Consumer processing of interior service environments. *Journal of Service Research*, *17*(3), 296–309. https://doi.org/10.1177/1094670514529606

Page, B., Trinh, G., & Bogomolova, S. (2019). Comparing two supermarket layouts: The effect of a middle aisle on basket size, spend, trip duration and endcap use. *Journal of Retailing and Consumer Services*, *47*, 49–56. https://doi.org/10.1016/j.jretconser.2018.11.001

Pantano, E., Pizzi, G., Bilotta, E., & Pantano, P. (2021). Enhancing store layout decision with agent-based simulations of consumers' density. *Expert Systems with Applications*, *182*, 115231. https://doi.org/10.1016/j.eswa.2021.115231

Park, C. W., Eisingerich, A. B., & Park, J. W. (2013). Attachment–aversion (AA) model of customer–brand relationships. *Journal of Consumer Psychology*, *23*(2), 229–248. https://doi.org/10.1016/j.jcps.2013.01.002

Park, C. W., MacInnis, D. J., Priester, J. R., Eisingerich, A. B., & Iacobucci, D. (2010). Brand attachment and brand attitude strength: conceptual and empirical differentiation of two critical brand equity drivers. *Journal of Marketing*, *74*(6), 1–17. https://doi.org/10.1509/jmkg.74.6.1

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Pons, F., Laroche, M., & Mourali, M. (2006). Consumer reactions to crowded retail settings: Cross-cultural differences between North America and the Middle East. *Psychology & Marketing*, *23*(7), 555–572. https://doi.org/10.1002/mar.20146

Quartier, K., Vanrie, J., & Van Cleempoel, K. (2014). As real as it gets: What role does lighting have on consumer's perception of atmosphere, emotions and behaviour? *Journal of Environmental Psychology*, *39*, 32–39. https://doi.org/10.1016/j.jenvp.2014.04.005

Rabbanee, F. K., Roy, R., & Spence, M. T. (2020). Factors affecting consumer engagement on online social networks: self-congruity, brand attachment, and self-extension tendency. *European Journal of*

Marketing, *54*(6), 1407–1431. https://doi.org/10.1108/ejm-03-2018-0221

Reagan, A. (2012). 6 ways to warm up the living room without turning up the heat. *Huff Post*. https://www.huffpost.com/entry/6-ways-to-warm-up-the-living-room-without-turning-up_b_584af923e4b0151082221abf

Roe, B. E., & Just, D. R. (2009). Internal and External Validity in Economics Research: Tradeoffs between Experiments, Field Experiments, Natural Experiments, and Field Data. *American Journal of Agricultural Economics*, *91*(5), 1266–1271. https://doi.org/10.1111/j.1467-8276.2009.01295.x

Roschk, H., Loureiro, S. M. C., & Breitsohl, J. (2017). Calibrating 30 years of experimental research: A Meta-Analysis of the atmospheric effects of music, scent, and color. *Journal of Retailing*, *93*(2), 228–240. https://doi.org/10.1016/j.jretai.2016.10.001

Rucker, D. D., & Galinsky, A. D. (2008). Desire to acquire: powerlessness and compensatory consumption. *Journal of Consumer Research*, *35*(2), 257–267. https://doi.org/10.1086/588569

Russell, J. A., & Mehrabian, A. (1974). Distinguishing anger and anxiety in terms of emotional response factors. *Journal of Consulting and Clinical Psychology*, *42*(1), 79–83. https://doi.org/10.1037/h0035915

Schöniger, M. K., & Adler, S. J. (2022). Effects of temperature and social density on consumer choices with multiple options. In *Springer eBooks* (83–95). https://doi.org/10.1007/978-3-030-95346-1_36

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental* designs for generalized causal inference (Vol. 1195). Houghton Mifflin. Boston, MA Houghton Mifflin. https://iaes.cgiar.org/sites/default/files/pdf/147.pdf

Sharma, S., Jawajala, R. P., Jawajala, A. R., & Sharma, M. (2022). To study the influence of antecedents, consumer lifestyles and consumer involvement: Determining the mediating role of visual merchandising. In Springer eBooks (359–379). https://doi.org/10.1007/978-3-031-12217-0_18

Sherman, E., Mathur, A., & Smith, R. B. (1997). Store environment and consumer purchase behavior: Mediating role of consumer emotions. *Psychology & Marketing*, *14*(4), 361–378. https://doi.org/10.1002/(sici)1520-6793(199707)14:4

Shimul, A. S. (2022). Brand attachment: a review and future research. *Journal of Brand Management*, *29*(4), 400–419. https://doi.org/10.1057/s41262-022-00279-5

Singla, V., & Gupta, G. (2019). Emotional branding scale and its role in formation of brand trust. *Paradigm*, *23*(2), 148–163. https://doi.org/10.1177/0971890719859668

Sirgy, M. J., Johar, J. S., Samli, A. C., & Claiborne, C. B. (1991). Self-congruity versus functional congruity: Predictors of consumer behavior. *Journal of the Academy of Marketing Science*, *19*(4), 363–375. https://doi.org/10.1007/bf02726512

Soper, D. (2019). *A-priori sample size calculator for structural equation models*. https://www.danielsoper.com/statcalc/calculator.aspx?id=89

Spangenberg, E. R., Sprott, D. E., Grohmann, B., & Tracy, D. L. (2006). Gender-congruent ambient scent influences on approach and avoidance behaviors in a retail store. *Journal of Business Research*, *59*(12), 1281–1287. https://doi.org/10.1016/j.jbusres.2006.08.006

Stokols, D. (1972). On the distinction between density and crowding: Some implications for future research. *Psychological Review*, *79*(3), 275–277. https://doi.org/10.1037/h0032706

Taft, C. (1998). Color meaning and context: Comparisons of semantic ratings of colors on samples and objects. *Color Research and Application*, *22*(1), 40–50. https://doi.org/10.1002/(sici)1520-6378(199702)22:1

Tang, J., & Zhang, P. (2020). The impact of atmospheric cues on consumers' approach and avoidance behavioral intentions in social commerce websites. *Computers in Human Behavior*, *108*, 105729. https://doi.org/10.1016/j.chb.2018.09.038

Tantanatewin, W., & Inkarojrit, V. (2016). Effects of color and lighting on retail impression and identity. *Journal of Environmental Psychology*, *46*, 197–205. https://doi.org/10.1016/j.jenvp.2016.04.015

Tantanatewin, W., & Inkarojrit, V. (2018). The influence of emotional response to interior color on restaurant entry decision. *International Journal of Hospitality Management*, *69*, 124–131. https://doi.org/10.1016/j.ijhm.2017.09.014

Thomson, M., MacInnis, D. J., & Park, C. W. (2005). The Ties that Bind: measuring the strength of consumers' emotional attachments to brands. *Journal of Consumer Psychology*, *15*(1), 77–91. https://doi.org/10.1207/s15327663jcp1501_10

Tran, V. D. (2020). Assessing the relationship between perceived crowding, excitement, stress, satisfaction, and impulse purchase at the retails in Vietnam. *Cogent Business & Management*, *7*(1), 1858525. https://doi.org/10.1080/23311975.2020.1858525

Tri, C., Kim, T., & Nga, D. Q. (2020). Do ambient scents affect customers' behavioral responses at fashion stores in Vietnam? *Tạp Chí Khoa Học*. https://doi.org/10.46223/hcmcoujs.econ.en.10.1.228.2020

Tse, A. C., Sin, L. Y., & Yim, F. H. (2002). How a crowded restaurant affects consumers' attribution behavior. *International Journal of Hospitality Management*, *21*(4), 449–454. https://doi.org/10.1016/s0278-4319(02)00035-x

Vos, M., Galetzka, M., Mobach, M. P., Van Hagen, M., & Pruyn, A. T. (2019). Measuring perceived cleanliness in service environments: Scale development and validation. *International Journal of Hospitality Management*, *83*, 11–18. https://doi.org/10.1016/j.ijhm.2019.04.005

Wang, L., Qian, D., & Li, O. (2019). The cross-modal interaction between sound frequency and color saturation on consumer's product size perception, preference, and purchase. *Psychology & Marketing*, *37*(7), 876–899. https://doi.org/10.1002/mar.21284

Wastiels, L., Schifferstein, H. N., Heylighen, A., & Wouters, I. (2012). Relating material experience to technical parameters: A case study on visual and tactile warmth perception of indoor wall materials.

Building and Environment, *49*, 359–367. https://doi.org/10.1016/j.buildenv.2011.08.009

Whiting, A., & Nakos, G. (2008). Functional density and its impact on retail satisfaction in cross-cultural contexts: can crowded stores be a good thing for retailers? *International Business: Research Teaching and Practice*, *2*(1), 1–11.

Williams, L. E., & Bargh, J. A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science*, *322*(5901), 606–607. https://doi.org/10.1126/science.1162548

Wolak, J., & Marcus, G. E. (2006). Personality and emotional response: strategic and tactical responses to changing political circumstances. *The Annals of the American Academy of Political and Social Science*, *614*(1), 172–195. https://doi.org/10.1177/0002716207306086

Yoo, C., Park, J., & MacInnis, D. J. (1998). Effects of store characteristics and In-Store emotional experiences on store attitude. *Journal of Business Research*, *42*(3), 253–263. https://doi.org/10.1016/s0148-2963(97)00122-7

Zhao, D., & Guan, F. (2023). Chinese consumers do not always respond to red: The influence of colors on perceived distance, spaciousness, and purchase intention of Chinese consumers. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.1028425

Zhao, X., Lynch, J., & Chen, Q. (2010). Reconsidering baron and kenny: myths and truths about mediation analysis. *Journal of Consumer Research*, *37*(2), 197–206. https://doi.org/10.1086/651257

Zwebner, Y., Lee, L., & Goldenberg, J. (2013). The temperature premium: Warm temperatures increase product valuation. *Journal of Consumer Psychology*, *24*(2), 251–259. https://doi.org/10.1016/j.jcps.2013.11.003