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User Preferences and Dislikes Concerning Sensory Stimulation in Shopping Center Resting Areas

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Abstract

Studies claim that shopping centers are considered a destination because they offer ambiance, experiences, and entertainment. With the rise in online shopping, shopping centers are no longer anchored by departmental stores but with their commercial facilities. Consistent with this change, more studies are needed to improve the interior quality of side facilities like entertainment and relaxing areas in shopping centers. This study is established to understand the sensory preferences and dislikes of a group of participants in shopping center resting areas. Consistent with this target, 200 participants took part in a questionnaire survey in Antalya, Turkey. The questionnaire consisted of 5 negative and 5 positive sensory qualities of space. These qualities were defined based on the five dimensions of a sensory space as established by Barbara Erwine. Participants were asked to list the negative qualities from most disturbing to least disturbing and then positive qualities from most satisfying to least satisfying.

Data from the questionnaire were analyzed using the SPSS computer program. Results showed that smell was rated as the most influential sensory quality that disturbs or satisfies participants in shopping center resting areas. Also, according to participant responses, positive and negative feelings through touching materials and surfaces were the least disturbing/satisfying quality in resting areas. This study also suggests the need for further studies on the role of smell in changing peoples' behavior in interior spaces and establishing design considerations that can improve the olfactory quality of spaces.

Keywords:

Shopping Centers, Resting Areas; Sensory Design, User Preferences, Sensual Stimulation

Alışveriş Merkezleri Dinlenme Alanlarında Duyusal Uyarılmaya İlişkin Kullanıcı Tercihleri ve Memnuniyetsizlikleri

Özet

Araştırmalar, alışveriş merkezlerinin ortamının, deneyim ve eğlence sundukları için bir zaman geçirme alanı olarak değerlendirildiğini göstermektedir. Online alışverişin artmasıyla alışveriş merkezleri artık çok katlı mağazalara değil, ticari işlevlerle işletilmeye devam etmektedir. Bu değişimle, alışveriş merkezlerindeki eğlence ve dinlenme alanlarda iç mekan kalitesinin iyileştirilmesine yönelik daha fazla araştırılmaya ihtiyaç duyulmaktadır. Bu çalışmada, alışveriş merkezi dinlenme alanlarındaki kullanıcıların duyusal memnuniyetleri ve rahatsız edici özelliklerin belirlenmesi amaçlanmıştır. Bu nedenle, Türkiye'nin Antalya İl'inde 200 kişinin katıldığı anket çalışması yapılmıştır. Anket, mekanın 5 olumsuz ve 5 olumlu duyusal özelliğinden oluşmaktadır. Bu nitelikler, Barbara Erwine tarafından

Anahtar Kelimeler:

Alışveriş merkezleri, Dinlenme Alanları, Duyusal Tasarım, Kullanıcı Tercihleri, Duyusal Uyarılma

oluşturulan duyusal mekanın beş boyutuna dayalı olarak tanımlanmıştır. Katılımcılardan olumsuz nitelikleri en fazla rahatsızlıktan en aza ve olumlu nitelikleri en fazla memnuniyetten en az memnuniyete doğru sıralamaları istendi. Ankette veriler SPSS programı kullanılarak analiz edildi. Sonuçlar, insanların iç mekanlardaki davranışlarını değiştirmede kokunun rolü ve mekanların koku alma kalitesini iyileştirebilecek tasarım değerlendirmelerinin önemini göstermektedir. Ayrıca katılımcı yanıtlarına göre, dinlenme alanlarında en az rahatsız edici/tatmin edici kalitenin malzeme ve yüzeylere dokunma yoluyla oluşan olumlu ve olumsuz duygular olduğu görülmüştür. Bu çalışma aynı zamanda iç mekanlarda insanların davranışlarını değiştirmede kokunun rolü ve mekanların koku alma kalitesini iyileştirebilecek tasarım düşüncelerinin belirlenmesi konusunda daha ileri çalışmalara ihtiyaç olduğunu ortaya koymaktadır.

INTRODUCTION

Users interact with interiors in various ways under different circumstances, but mostly these relationships happen through senses. Psychologists have recently started to reject the separation of a person from her or his environment, and believe that to create pleasant and productive physical environments, it is necessary to consider users and context as a whole (Stokols, 1995). The sensory experience of spaces is about the ongoing engagement of the body in interior spaces and therefore, interior designers need to design spaces that will address pleasant bodily sensations in users (Whitehead, 2018).

'Embodiment' is a term that is raised as the outcome of understanding the importance of sensory stimulation in environments. 'Embodiment space' is a place where users engage with their surroundings through their senses (Low, 2014: 20). Seamon (2015) states that the value of research on environmental embodiment reveals knowledge of human's unnoticed experiences in space because considering unnoticed interactions will help interior designers increase the quality of their designs.

Erwine (2017) discusses that with designers' main focus on the visual quality of space, other sensual qualities have been overlooked in architecture. She refers to an increase in the visual representation of spaces with no human figure in them and discusses the 20th-century architecture and how design considerations are narrowing down to basic comfort requirements. As a result, the population is not satisfied with its environment and due to a lack of positive sensory stimulation people are finding it difficult to connect with places.

One of the domains that have given considerable concern to sensory design is retail store design. This interest is based on results from a variety of studies that address the importance of sensory stimulation on customer behavior and satisfaction in stores (Sit and Birch, 2014; Ahmad, 2012; Howard, 1992). With the number of shopping centers on the rise, side facilities such as resting and entertainment areas have started to be considered an important component of the retail experience. Shopping center sitting/resting areas play an important role in shaping guest impressions and therefore the design quality of these spaces plays an important role in the development of shopping centers (Piotrowski, 2016). While existing studies have mainly focused on multi-sensory design in the shopping experience, this study aims to focus on how positive and negative stimulation of peoples' senses will improve or ruin their stay in shopping center sitting/resting areas.

The current article has adopted five dimensions of a sensory space as defined by Barbara Erwine (2017) and compared the influence of positive and negative stimulation of these dimensions on a group of participants. The theoretical framework of the current study will increase the designer's understanding of the role of sensual stimulations on user experience and behavior in space while results from the survey will identify the important sensory qualities that will improve the design quality of shopping center resting areas.

Sensory Stimulation in Interiors

The design aimed at enhancing people's pleasure and feelings must incorporate sensory experiences (Schifferstein, 2011). Studies claim that urban spaces are experienced and remembered through a combination of sights, sounds, smells, textures, tastes, and temperature conditions and not only vision (Thibaud, 2011 in Wankhede and Wahurwagh, 2017). Sensory experiences have entries and borders, beginnings and endings, and just like architectural geometries, design is capable of shaping them (Erwine 2017). To shift interior design from a pleasant 'look' or an 'image' to an 'atmosphere with pleasant spatial

qualities' it is important to embrace the sensory components of the space with design (Whitehead, 2018). Results in research by Cho and Kim (2017) show that users have responded to sensory factors more than morphological factors. Based on this result, it has been discussed that user emotions can be intentionally stimulated if the sensory factors are embedded in the design of spaces with a purpose.

The sensory qualities of space that are generated by space shape the user's perception of the space, and therefore considering users' sensory stimulation in designing space is now a necessity (Brooker and Weinthal, 2017). As a result of capitalism, architectural space has mainly been reduced to the visual sense, and spaces that stimulate sensory experiences are regarded as a luxury. Understanding users' sensory preferences and dislikes and considering these factors during the design process allows interior designers to improve the quality of spaces. Alan Dilani's (2007) study on the stimulation of healthy behavior through designing the built environment discusses that positive stimulation of eyes, ears, skin, tongue, or nose are all fundamental human needs. Parallel with Dilani, Barbara Erwine (2017) classified a space that provides sensory experiences into five categories: light space, somatic space, thermal space, acoustic space, and olfactory space. The scope of each category is discussed below.

Light Space

Light defines the space and form of interior space (Brooker and Stone, 2007). Proper lighting helps users to show improved task performance and increase their sense of safety and comfort (Slater, Bordass and Heasman, 1996). On the other hand, a lack of sufficient and appropriate light exposure can have a bad influence on standard human rhythms and lower human performance, safety, and health (Bellia et al., 2011). The primary concern in interior lighting is about providing adequate visual comfort based on the function. The implications of the amount of daylight in a space also need to be taken into consideration (Webb, 2006).

Somatic Space

A somatic design needs to embody familiar features and traditions for users so that they are recognizable. Somatic space connects the user's mind and body to the surrounding environment and therefore it is a crucial consideration in terms of improving the sensory design. Creating a somatic space for users requires an understanding of the human body and a focus on body experience (Bhatt 2013). Users seek meaning and physical inhabitation in interiors to feel part of an environment. The sense of touch plays the most important role in somatic experiences and this respect, surface patterns, and materials are important considerations for creating a somatic space (Erwine, 2017).

Thermal Space

A good indoor climate with appropriate temperature and humidity is an essential factor for users' well-being and improved performance. Many studies claim that indoor climate has impacts on productivity and while too hot makes us drowsy and reduces productivity, over-cooling makes us restless and leads to a lack of concentration (Reddy et al., 2012).

Acoustic Space

Throughout history, acoustics have played an important role in defining the character of specific spaces. Results of a study have shown that high noise levels resulted in poor sleep and influenced patient well-being (Freedman et al., 1999). Also, it is claimed that noise affects our sense of safety, level of productivity, and functionality (Juslin and Sloboda, 2010). Background noise such as heating, ventilating, and air-conditioning exists in many everyday environments. Some studies claim that background noise causes headaches and irritations among staff which lead to poor job performance (Tokita, 1980, Persson, 2001).

All the elements and materials of an interior are, in a way, acoustic because they affect sound quality by absorbing, blocking, or reflecting it. Designers' goal for acoustics is to reduce or at least filter unwanted sounds and instead highlight beautiful and serene sounds (Dilani, 2007).

Olfactory Space

The olfactory space stimulates the sense of smell and it is the most complicated prototype in interior design. Studies claim that stimulating the sense of smell by adding an olfactory component to the physical environment can influence the level of stress and tension, learning ability, performance and memory (Washburn et al., 2003, Iwahashi, 1992). The smell can also be a component that defines the identity of interior space. This is because smell plays a significant role in defining the character of objects and places (Tuan, 1977).
Appropriate types of smell have to be considered about the events and activities that will happen in that space (Augustin 2009), but there are a variety of design solutions that engage users with pleasant scents and smells. For example, adding fragrances and using herbs will enhance the pleasant aroma of an interior. Also using fragrant flowers, aromatic woods, aromatic polishes, herb pouches, and aromatic plants will all add pleasant scents to the environment (Pearson 1998).

Sensory Design in Retail Facilities

Sensory branding is a term that is defined as using all five senses to add meaning to the customer shopping experience (Hultén, 2011; Krishna, 2010). The physical environment of retail stores plays an important role in creating sensory branding. There has been an increase in studies with a focus on the influence of sensory stimulation on shopping to improve retail quality.

The sense of sight is one of the most important senses in retail design because the visual appearance of the space can seduce customers very quickly (Lindstrom, 2005). This is why, up until recently, most priorities were given to the visual appearance of retail stores (Kotler, 1973). However, with the increasing popularity of sensory branding, designers started to aim for building emotional bonds with consumers by engaging their senses (Smilansky, 2009; Gobe, 2001).

Studies in the field of consumer research point to music being a variable that influences different consumer behaviors, and therefore customer satisfaction from the type and quality of music and sounds in retail stores must be considered (Gueguen & Jacob, 2010; Kellaris, 2008). Lindstrom (2009) claims that repeating the same sounds can help build brand identity. Milliman (1982) established research on the effect of music tempo on shoppers' buying behaviors in grocery stores. The results of this study show that playing slow music increases the time customers spend in the store and also increases the amount of shopping. Results also show that loud music makes customers spend less time in the store (Smith and Curnow, 1966).

Touch is a sense that connects the physical body of customers with the brand and retail store environment. It is also believed that the sense of touch influences all other senses which makes it crucial (Siegel, 1970). Touching is a means for generating information and emotions during the purchase decision (Peck and Shu, 2009). Peck and Wiggins (2006) state that a positive stimulation of touch will shape positive shopping behavior. Touch allows consumers to feel the 'texture, hardness, temperature and weight information' (Klatzky and Lederman, 1992). A study by Chen et al. (2009) addressed that soft textures are perceived to be more pleasant to touch than hard textures.

Jobber (2007) explains that since scents have the power to change people's moods, this sensory quality can be used by retailers to create an atmosphere. It also argues that a pleasant aroma in the environment influences customer responses in a positive way (Pelsmacker et al., 2005; Mattila and Wirtz, 2001). A 2013 study by the Global Journal of Commerce and Management Perspective argues that "ambient scent has the strongest impact when it comes to enhancing consumer behavior in terms of emotion, evaluation, willingness to return to a store and purchase intention (cited in Mealha, 2017)". Smell preferences vary among individuals and different cultures. While the smell of cheese tends to be popular in Europe, this smell is considered awful in Southeast Asia (Hultén, 2017) and therefore, the smell is a very challenging sense to be considered in the design.

Temperature is another sensory quality that plays a role in the quality of human experiences in interiors. While there is a gap in research about the relationship between the indoor climate of the store and shopping behavior, it is discussed that very high and low temperatures lead to avoidance behavior (Bohl, 2012; Baker,

1987). Results in a study by d'Astous (2000) showed that temperature influences women more. In another study, it is argued that temperature influences people's interpersonal attraction to the environment (Griffitt, 1970).

Consistent with the discussions above, some studies underline the importance of sensory quality in the retail environment. With the number of shopping centers on the rise, sub-spaces like eating areas, entertainment areas, and resting/sitting areas also play an important role in supporting retail stores (Sit and Birch, 2014; Ahmad, 2012; El-Adly, 2007; De Nisco and Rosaria Napolitano, 2006). This study is developed with an emphasis on the importance of considering the sensory stimulation of customers in all shopping center resting areas and focuses on identifying the most disturbing and most-satisfying sensory quality in shopping center resting areas according to a group of participants.

METHODOLOGY OF RESEARCH

In this study based on Erwine (2017), sensory space, amount of light, touching the finishing materials, the temperature of space, sound/noise, and smell of space have been considered as the five main sensory qualities in resting areas. The main intention was to establish the most influential sensual stimulation that would encourage customers to spend longer time in resting areas and the most disturbing sensual stimulation that would make customers leave the space. Based on this intention, the current study is established by comparing how closely participants have responded to the most and least disturbing/satisfactory sensual stimulation that will make them enjoy or leave shopping center resting areas. The specific objectives of the study are as follows:

1. To determine the sense which is most affected by negative stimulation in a space, resulting in an unpleasant stay for the user.
2. To determine the sense which is most affected by positive stimulation in a space, resulting in a pleasant stay for the user.
3. To determine whether there are any relationships between sensual stimulation preferences and dislikes.

A questionnaire survey was conducted with 200 participants. Data were collected at the resting areas of 4 different shopping centers in Antalya. Participants were selected randomly and among those who accept to take part in the survey. Data were obtained using a face-to-face questionnaire survey and the interviewer asked the questions to overcome any confusion during the completion of the questionnaires.

The questionnaire survey was comprised of closed-end questions and consisted of two sections. In the first section, five negative qualities of the space (Table 1) were proposed to participants who were then asked if they would agree to sit and rest in a shopping center resting area, which of these five negative sensory stimulations would make them leave the sitting area quickly. Participants were asked to prepare a list of priorities and order the proposed qualities from most disturbing to least disturbing.

Table 1- The negative sensory qualities of space proposed to participants

Space Sensory Quality	**Negative Sensory Stimulation**
Light	The amount and type of lighting bother you.
Material Surfaces	You feel bad/uncomfortable when your skin touches surfaces.
Temperature	It is so hot/cold that you feel uncomfortable.
Noise	There is too much noise.
Smell	There is a bad smell.

In the second section, five positive sensory stimulations of a space (Table 2) were proposed to participants who were then asked if they would agree to sit and rest in a shopping center resting area. This time, participants were asked which of the proposed sensory stimulations would make them sit and spend more time in the resting area. Participants were asked to prepare a list of priorities and order the proposed qualities from most satisfactory to least satisfactory.

Table 2- The positive sensory qualities of space proposed to participants

Space Sensory Quality	**Positive Sensory Stimulation**
Light	The amount and type of lighting please you.
Material Surfaces	You feel good/pleased when your skin touches surfaces.
Heat	The room temperature is comfortable for you.
Noise	There are pleasant and tempting sounds.
Smell	There is a pleasant smell.

To analyze data with SPSS after data collection, participants' list of dislikes and preferences have been transformed into a numerical coding (5 presenting the most disturbing/satisfying and 1 representing the least disturbing/satisfying). Data analysis is conducted in three phases. In the first phase, qualities that have been listed as the most and least disturbing/satisfying by a majority of participants were identified. In the second phase of analysis, the role of gender on participant responses was studied. Since gender plays a role in some studies related to sensory preferences (Brasche, Bullinger, Morfeld, Gebhardt and Bischof, 2001, Mazuch, 2005, Mourshed and Zhao, 2012), this phase intended to find out if gender as a variable played a role in the findings of the current study. In the final phase of the analysis, focus groups with similar responses were identified and specific correlations were generated with the SPSS to distinguish if any similarities and differences exist in comparison with the first phase of research.

FINDINGS

126 females and 74 males participated in the questionnaire survey. In the first phase of analysis the intention was to identify the most/least disturbing and most/least satisfying qualities according to participant responses. Findings from the first stage of this phase showed that most of the participants rated 'a bad smell' as the most disturbing sensory quality that would make their stay in a space unpleasant. In the second stage of this phase, findings showed that most of the participants rated a bad feeling from touching material surfaces' as the least disturbing quality of a space. Chart 1 and 2 shows the frequency of participant responses to the most and least disturbing sensory quality in a space.

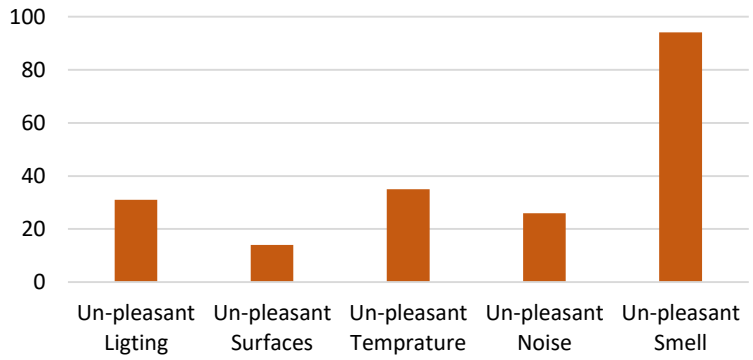

Chart 1- Frequency of responses to the most-disturbing sensory quality of space among participants

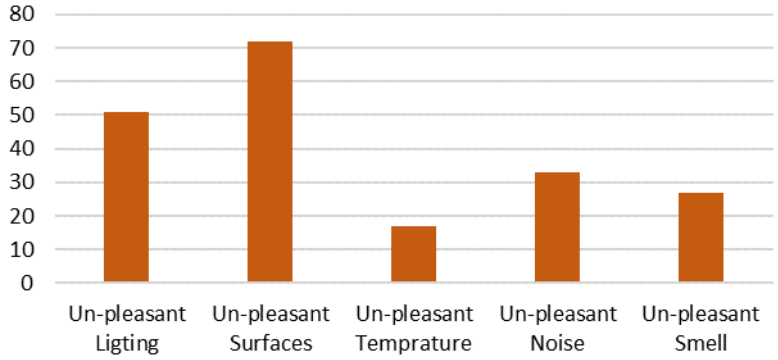

Chart 2- Frequency of responses to the least-disturbing sensory quality of space among participants

Findings showed that a pleasant smell was rated as the most satisfying quality by a majority of the participants which was similar to the findings from the previous stage. The only difference from the first stage was the frequency percentage. In contrast to the first stage featuring a significant difference between the percentage of participants who rated temperature as the most disturbing quality, the number of participants who rated temperature as the most satisfying quality was very close to the number who rated smell (Chart 3). Therefore, in this phase, smell and temperature both have been identified as important sensory qualities for participants that will support their satisfaction with the physical environment of shopping center resting areas.

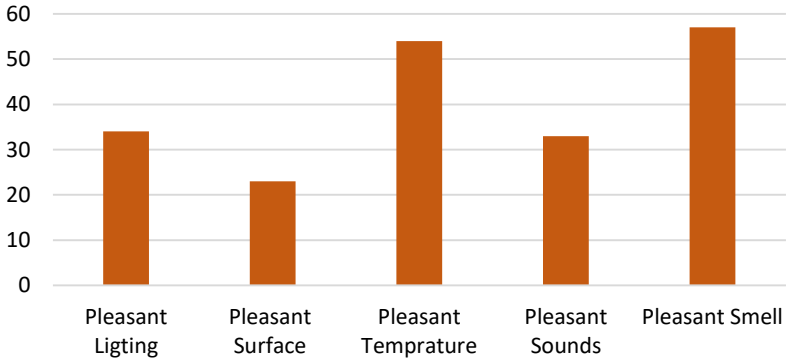

Chart 3- Frequency of responses to the most-satisfying sensory quality of space among participants

Similar to the least disturbing quality of space, positive stimulation by the sense of touch through the choice of materials has been rated as the least satisfying quality of space by a majority of the participants (Chart 4). Similar findings suggest that, according to participants, stimulating the sense of touch through materials is the least important quality in improving or reducing the quality of shopping center resting areas.

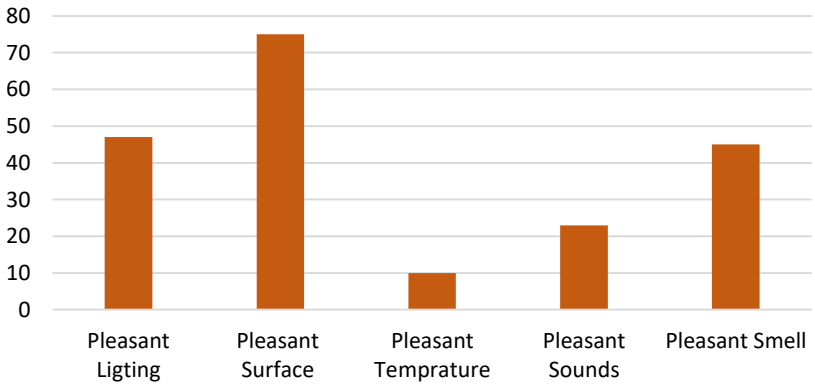

Chart 4- Frequency of responses to the least- the satisfying sensory quality of space among participants

At the end of this phase of analysis, positive and negative stimulation by smell has been defined as the most important sensory quality in shopping center resting areas because it plays a crucial role in satisfying or disturbing the participants.

The second phase of analysis was about the role of gender in shaping the findings. In this phase of analysis, gender was defined as a variable and the most and least disturbing/satisfying qualities of space were compared accordingly. Findings at this stage demonstrated that gender did not play a significant role in changing participant responses (Table 3). At this point, it was addressed that gender is not a variable in this survey.

Table 3- Frequency of participant answers based on gender

Gender	**Number of participants**	**Most-disturbing Sensory Quality**	**Least-disturbing Sensory Quality**	**Most-satisfying Sensory Quality**	**Least-satisfying Sensory Quality**
Female	126	Smell 49%	Material Surface 38%	Temperature 33%	Material Surface 39%
Male	74	Smell 41%	Material Surface 32%	Temperature 28%	Material Surface 35%
Total	200				

The final phase of analysis was about studying correlations between participants who rated similar qualities as the most and least disturbing/satisfying. In this phase, two categories were identified based on similarities between participant responses.

- Category A: Including groups with similar choice of sensory quality (light, surfaces, temperature, noise, smell) for the most disturbing quality in shopping center resting areas.
- Category B: Including groups with similar choice of sensory quality (light, surfaces, temperature, noise, smell) for the most satisfying quality in shopping center resting areas.

In the first stage of this phase, groups in category A were defined as focus groups, and the scope of analysis involved comparing sensory qualities that were rated as the most satisfactory by a majority of participants. The intention was to determine the existence of interesting relationships between sensual stimulation preferences and dislikes. Findings from this stage of the analysis showed that most of the participants find the positive and negative stimulation of a similar quality as most disturbing and most satisfying. Only the participants who chose noise as the most disturbing quality found noise, temperature, and smell as the most satisfying with an even frequency (Figure 1). However, there is a considerable percentage with a different choice of disturbing and satisfying sensory qualities, suggesting that addressing user dislikes cannot guarantee satisfaction.

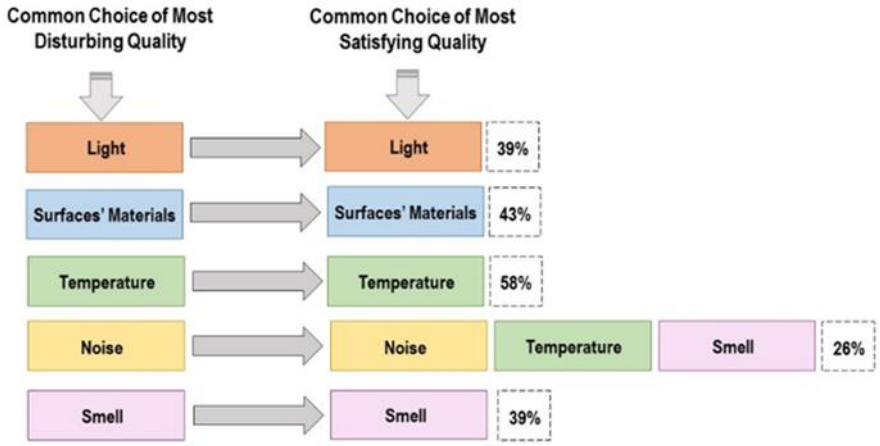

Figure 1- Comparison of participant responses to the most disturbing and most satisfying sensory quality

In the next stage of this phase, the same groups (category A) were defined as focus groups, but this time, the scope of analysis involved comparing sensory qualities that were rated as least disturbing by a majority of group members. The aim was to compare these findings with findings from the first phase of the analysis. Findings from this stage of the analysis confirm that unpleasant feelings from touching materials were the least disturbing quality among most of the groups' participants (Figure 2).

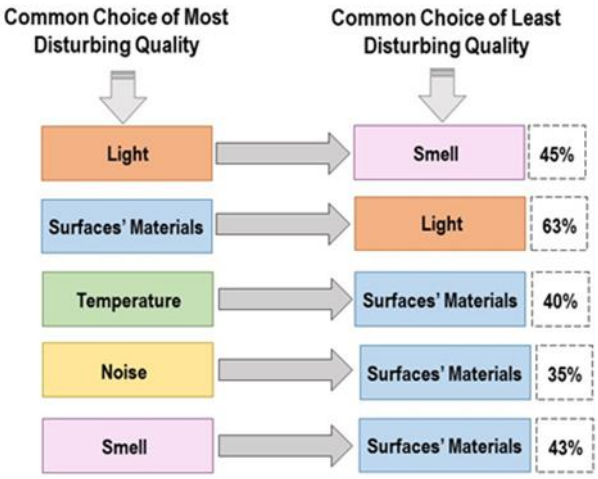

Figure 2- Least disturbing sensory qualities are chosen by a majority of participants in category A

An interesting finding at this stage was the absence of temperature and noise in the least disturbing qualities of space according to the group classifications. Next, the same subject was analyzed by redefining the group classifications. This time, groups in category B were defined as focus groups and the sensory qualities that were rated as the least satisfying by members of these groups were analyzed. The aim was to check for differences in comparison to the findings from the previous stage. The results were very similar to the previous stage. As shown in figure 3, temperature and noise were not defined as the least disturbing qualities according to a majority of group members. The only difference from Figure 3 was the absence of smell, which, due to a high frequency of smell as the most disturbing sensory quality of space, this difference is coherent.

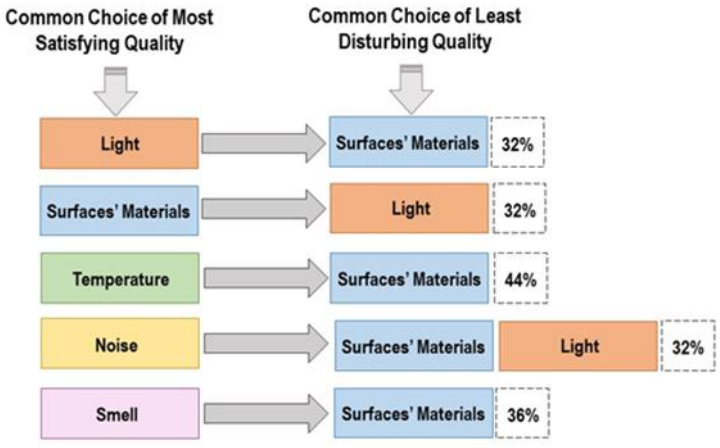

Figure 3- Least satisfying sensory qualities are chosen by a majority of participants in category B

The same relationship analysis between responses of group members from categories A and B to the least satisfactory sensory quality of space was repeated. The findings of this analysis were very similar to the previous two stages and temperature and noise were not included in the results. According to these findings, it was discussed that both temperature and noise were influential sensory qualities in increasing or reducing participant satisfaction in shopping center resting areas. Consistent with this discussion, the frequency of value 4 for the pleasant and unpleasant conditions of sensory qualities was analyzed. The aim was to find out

which sensory qualities had the highest disturbing and satisfactory ratings after smell. Results from this analysis confirm results from the previous stages.

According to the final results, the temperature has been the second most disturbing/satisfying quality by a majority of participants before noise which is rated as the most disturbing/satisfying sensory quality. Chart 5 shows the frequency of participant responses with a value of 4.

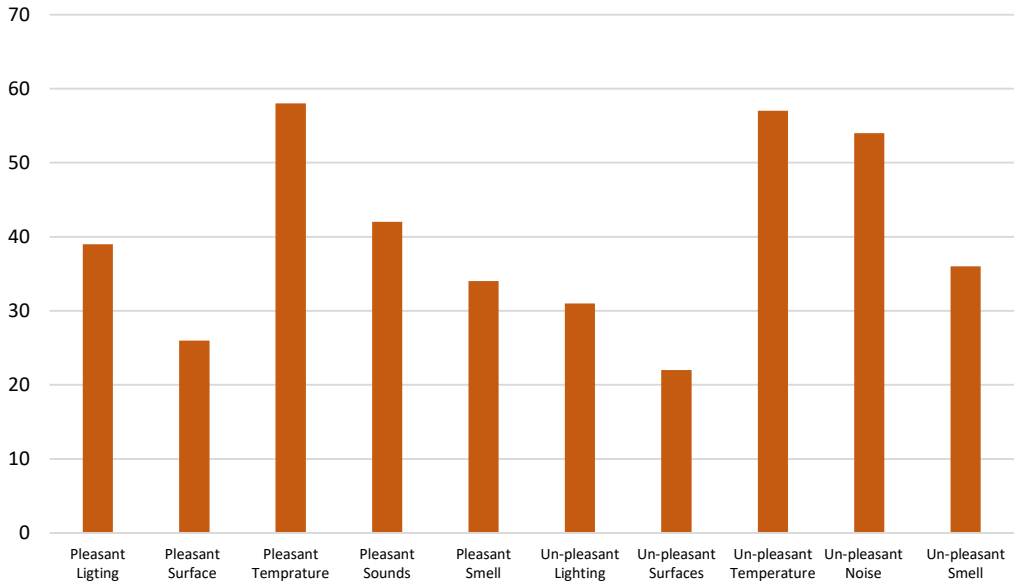

Chart 5- Frequency of participant responses with the value of 4 for the most satisfying/disturbing quality in space

CONCLUSION

Studies suggest that designers can improve the quality of human experiences by considering users' sensory stimulation in interior spaces (Whitehead, 2018; Brooker and Weinthal, 2017; Schifferstein, 2011). Consistent with the importance of sensory experience in interiors, many studies are established to understand the influence of users' sensory stimulation in space on their pattern of behavior. One of the fields in which sensory design has gained considerable significance in retail stores.

With the number of shopping centers increasing, common spaces inside these facilities such as resting areas, entertainment areas and eating areas have also started to play an important role in supporting the customer shopping experience (Sit and Birch, 2014; Ahmad, 2012; Howard, 1992). While most studies focus on the interior space of stores and study the role of customers' sensory experience on their shopping behavior, there is a gap in research on the influence of sensory stimulation in shopping center resting and entertainment facilities. Since improving the physical quality of these spaces adds quality to people's shopping experience, improving sensory qualities in these spaces is also worth considering.

Consistent with the lack of adequate research about the physical quality of shopping center resting areas, this study intended to study a group of participants' preferences and dislikes about their sensory stimulation in a space. The questionnaire used in this survey proposes five positive and five negative sensory stimulations in space. In this questionnaire, survey participants were asked to identify the most disturbing and most satisfying sensory qualities that would motivate or prevent them from spending time in shopping center resting areas.

Findings from this survey demonstrated that unpleasant smell was the most disturbing sensory quality according to a majority of participants. Results also showed that the second most disturbing sensory quality in resting areas was inappropriate indoor temperature. Participant preferences were very similar in these findings. The good smell was identified as the most satisfying sensory quality followed by good indoor temperature as the second most satisfying sensory quality in resting areas. The only difference identified between user choices for dislikes and preferences was concerning the frequency of responses. While the number of participants who rated bad smell as the most disturbing quality in space was significantly more

than those who rated bad temperature, the number of participants who rated good smell as most satisfying was very close to those who rated good temperature.

On the other hand, participant responses also showed that unpleasant and pleasant feelings through touching the surfaces and materials were rated as the least disturbing and least satisfying sensory quality in resting areas. Results from this study suggest that while interior designers pay special attention to this quality of space because it attracts the eye, sensory qualities like smell, temperature and noise play a more important role in encouraging or preventing users to stay in resting areas.

An analysis of relationships between responses has identified that while most participants rated the same sensory quality as the most disturbing and most satisfying, a considerable percentage has different choices on the sensory quality which is the most disturbing and most satisfying. Based on this result, the current study suggests that interior designers focus on all sensory qualities, because improving user dislikes does not guarantee their preferences.

Finally, this study also emphasizes the important role of temperature and sound in resting areas, especially as sensory qualities that provide user satisfaction. The fact that temperature was rarely rated as the least satisfactory and least disturbing confirms the important role this quality plays in encouraging or preventing participants from spending time in shopping center resting areas. Studies have argued that appropriate ventilation system design is the best attempt at improving the air quality inside shopping centers (Abel and Elmroth, 2007), so designers need to take this issue seriously.

In conclusion, results show that smell plays a very important role in disturbing or satisfying users in shopping center resting areas. A review of the literature identifies the gap in research related to the role of smell on human behavior in interior spaces. The reason behind this lack of research is arguably the complexity of mapping olfactory components due to various sources and receptors (Corey and Ache, 2016). The current study suggests the development of further studies related to the role of smell on human behavior in interior spaces and also establishing design considerations that can improve the olfactory quality of spaces. As Tracy Pepe (2000) states “every place has a smell, it can be incidental and accidental, or it can be on purpose and designed for a purpose”. In this respect, with consideration to the sensory quality of space as a design input, it can be possible to design an environment with certain smells on a purpose and with a purpose.

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