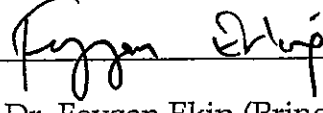


**THE ROLE OF COLOR
ON THE ASSESSMENT OF RETAIL SPACES:
RESTAURANT ATMOSPHERICS**

**A THESIS
SUBMITTED TO THE DEPARTMENT OF INTERIOR
ARCHITECTURE AND ENVIRONMENTAL DESIGN
AND THE INSTITUTE OF ECONOMICS AND
SOCIAL SCIENCES
OF BİLKENT UNIVERSITY
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS
FOR THE DEGREE OF
MASTER OF FINE ARTS**

**By
Meliha Begüm Söker
July, 2009**

I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Fine Arts.



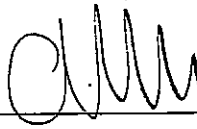
Assoc. Prof. Dr. Feyzan Ekip (Principal Advisor)

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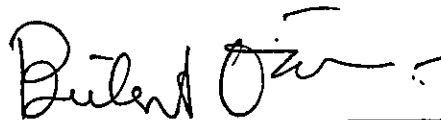
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Approved by the Institute of Fine Arts



Prof. Dr. Bülent Özgüç, Director of the Institute of Fine Arts

ABSTRACT

THE ROLE OF COLOR ON THE ASSESSMENT OF RETAIL SPACES: RESTAURANT ATMOSPHERICS

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MFA in Interior Architecture and Environmental Design

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July, 2009

This study aims to search the effects of color on user perception and evaluation of restaurant atmospherics. A case study was designed and done with three types of restaurant (lower class, middle class and upper class) using eight basic colors (purple, pink, red, orange, brown, yellow, green and blue). Undergraduate students of the Department of Interior Architecture and Environmental Design at Bilkent University participated in this research. According to the findings of the research, color preferences were effective on certain user perceptions. Results indicated that warm colors are preferred more than cool colors in general. It was found that participants associated lower prices more with warm colors. Contrary to the expectations, gender differences in relation to color preference were not found in this study.

KEY WORDS: Atmospherics, color preferences, color associations, users' assessments

ÖZET

RENKLERİN PERAKENDE MEKANLARININ DEĞERLENDİRİLMESİNDEKİ ROLÜ: RESTORAN ATMOSFERİĞİ

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Danışman: Doç. Dr. Feyzan Erkip
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Bu çalışma, renklerin kullanıcıların restoranların atmosferik unsurlarını algılaması ve değerlendirmesi üzerindeki etkisini araştırmayı amaçlamıştır. Üç farklı restoran tipi (düşük, orta ve yüksek kalitede) ve sekiz temel renk (mor, pembe, kırmızı, turuncu, kahverengi, sarı, yeşil ve mavi) kullanılarak bir alan araştırması yapılmıştır. Araştırma, Bilkent Üniversitesi İç Mimarlık ve Çevre Tasarımı Bölümü'nden 96 öğrencinin katılımlarıyla gerçekleştirilmiştir. Araştırmanın bulgularına göre, renk seçimleri kullanıcı algılarının bazılarını etkilemiştir. Sonuçlara göre, genel olarak sıcak renkler soğuk renklere göre daha çok tercih edilmiştir. Katılımcıların renk tercihleri sıcak renklere doğru kaydıkça fiyat beklentilerinde düşüş gözlenmiştir. Beklenenin aksine, bu çalışmada renk seçimleriyle ilgili cinsiyet farklılığı bulunamamıştır.

Anahtar Kelimeler: Atmosferik unsurlar, renk tercihleri, renk çağrışımları, kullanıcı değerlendirmesi

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1. INTRODUCTION

Color is a part of our everyday life. People define objects, spaces and also their emotions with colors. Color which has the effect to lead and affect our judgments and perceptions is studied extensively in the literature.

Color is widely used in retail spaces due to its impact on human judgments. Restaurant settings are the spaces where people socialize and interact with others in a leisurely environment. To analyze the connection between physical environment and color, color preferences and associations of individuals were chosen as the focus of this study.

As well as color, atmospherics of a retail space influence users' assessment on these physical environments. Environmental quality, service quality, product quality and price compose the factors that lead to the assessment in restaurant settings. Thus, this study is based on questioning the role of color on the assessment of restaurant atmospherics.

1.1. The Aim of the Study

The main purpose of this study is to understand the effects of color on users' assessment on restaurant atmospherics. Researches about atmospherics that are related to color are limited, but the effect of color may depend on individuals' color preferences and color associations, so that these two subjects are examined in this study. Restaurant environments are chosen as the case as users prefer these leisurely environments with their own free will. In this study the assessment of restaurants is analyzed in relation to individuals' color preferences and color associations.

Additionally, this study compares colors in different restaurant types in order to find out their effects on judgments of users about restaurant quality. Therefore, referring to previous researches (Babin, Hardesty and Suter, 2003; Bellizzi, Crowley and Hasty, 1983; Crowley, 1993) color is divided into two: warm colors (red, orange, yellow, pink, brown) and cool colors (blue, green, purple). Differences in user perception (environmental quality, product quality, service quality and price) are compared according to this color groups. Since gender differences were noted in previous researches (Heide and Grønhaug, 2006; Yıldırım, 2005; Yıldırım, Akalın-Başkaya and Hidayetoğlu, 2007), gender is also regarded in this study.

1.2. Structure of the Thesis

This study focuses on the role of color on the assessment of restaurant atmospherics. The first chapter includes introduction. To understand the relation of color with physical environment, second chapter examines the role of color in environmental appraisal. Individuals' color preferences and color associations are analyzed with respect to cultural and demographic variables.

The third chapter explains the effects of atmospherics on retail spaces. Firstly, the term 'atmospherics' is described and then to construct a relation between this term and retail spaces, users' assessment of restaurants is examined. In this study, atmospherics is divided into five: exterior variables, general interior variables, layout and design variables, point-of-purchase and decoration variables and human variables. In order to find out the effects of color, color in atmospherics is studied in detail. Then, restaurant setting was analyzed to understand the users' assessment in retail spaces.

The fourth chapter describes the research of this study. Objectives of the field survey are explained with variables, research questions and hypotheses. The method of the study follows with sample selection and procedure. After these sections, results and discussion of the findings are given.

Finally, chapter five includes the conclusion of this study. Limitations of the current study are discussed and suggestions for future studies are provided.

2. THE ROLE OF COLOR IN ENVIRONMENTAL APPRAISAL

To explore the role of color, color preferences and color associations of individuals are examined in this chapter. The explanation of these two terms is based on cultural and demographic variables.

2.1. Color Preferences

Color preferences of individuals are regarded as linked with subjectivity (Ekici, Yener and Camgöz, 2006), so that subjective criteria of individuals such as cultural and individual differences lead to their judgments on color preferences (Ou, Luo, Woodcock and Wright, 2004a). In addition to culture, demographic variables of individuals such as age and gender could have an impact on their responses to color (Manav, 2007). According to these findings, color preferences are examined in relation to the effects of cultural and demographic variables.

2.1.1. Culture and Color Preferences

The role of culture on color preferences is a controversial issue in the literature, because there are two conflicting arguments. The first one claims

that cultural differences affect the color preferences of individuals, whereas the second one disagrees with this opinion.

Manav (2007) claims that color preferences of people could be affected by geographical and cultural factors; moreover the order of the preferences is formed by the contribution of linguistic and cultural factors. These statements could be supported by the cross-cultural research of Ou, *et.al.* (2004b) that is related to color emotion and color preferences. Their research indicates that there were differences between Chinese subjects and English subjects in those respects. According to their findings, Chinese subjects preferred clean, fresh or modern colors for like-dislike color-emotion scales, whereas the tendency to prefer those colors did not occur with British subjects. On the other hand, British subjects who took part in this study preferred active colors for tense-relaxed colors-emotion scales, whereas Chinese subjects preferred hard, heavy, masculine or dirty colors for this scale. Another example supporting the first argument is a cross-national study of consumers' color preferences. It shows that there are differences in color preferences of people from eight countries: Austria, Brazil, Canada, Colombia, Hong Kong, People Republic of China, Taiwan and United States (Madden, Hewett and Roth, 2000).

There are also researches which has similar findings of color preferences for different cultures. In the study of Dittmar (2001), it is found that German adults mostly preferred blue and least preferred yellow from the colors blue, green, red and yellow. Although the contexts are different, Camgöz, Yener and Güvenç (2002) found a similar result as blue was the most preferred color of Turkish subjects regardless of the background color. Despite cultural differences, these studies show that blue is the most preferred color in both cultures.

Another example for this argument is the experiment of Cernovsky, Haggarty and Kermeen (1998) that defines color preferences of two different cultures: Arctic Inuit and Southern Canadians. Although the subjects in these two cultures had been grown in completely different physical and cultural environments, differences in color preference were not found between these groups. Thus, the research indicate that although culture appears as an important factor in color preferences, the influence of it should not be overestimated because different experiments provide conflicting results.

2.1.2. Demographic Variables and Color Preferences

Age and gender are the selected demographic variables of individuals for this study. Because these variables cause physiological and psychological

differences, researchers (Dittmar, 2001; Ellis and Ficek, 2001; Zentner, 2001) studied the impact of these variables on color preferences.

Just like the effect of culture, gender is also a controversial issue. Relation between gender and color preferences is displayed by some experiments; on the other hand the results of other researches do not verify this relation.

Although there are several studies about gender, the nature of relationship between gender and color preferences is not clearly stated. Different experiments indicate different relations between gender and color preference.

Lange and Rentfrow (2007) claim that gender differences in color preferences exist since females prefer yellow more than male. Ellis and Ficek (2001) reveal that there is a significant difference in color preferences of male and female subjects; males prefer blue and females prefer green. Singh (2006) also claims that gender differences exist in the perception of color. From another perspective, de Destefani and Whitfield (2008) claim that females look like better prepared to handle color selection and preference than males during the decision making process.

On the other hand, in the experiment of Camgöz *et al.* (2002), gender has an insignificant influence on color preferences of the sample group. The

experiment of Zentner (2001) provides similar results; there is not any evidence for widespread gender stereotypes in color preferences of 3 to 4 years old children. The extensive experiment of Ellis and Ficek (2001) shows that sexual orientation of individuals (either heterosexual or homosexual/bisexual) does not affect their color preferences.

Most of the researches show that one could not ignore the changing relation between age and color preferences (Dittmar, 2001; Zentner, 2001; Manav, 2007). In some researches, age is used as a base of the study while expressing the most and the least preferred color of individuals (Terwogt and Hoeksma, 1995; Dittmar, 2001; Zentner, 2001; Pitchford and Mullen, 2005).

Psychological, biological, occupational and medical issues may be the reasons of age-related changes in color preferences in adulthood (Dittmar, 2001), so that it can be said that color preferences change during life span of individuals.

According to the research of Manav (2007), age is a significant and defining factor in the preference of achromatic color black. The well-known color preference for blue appears to change with age in the experiment of Zentner (2001). But, the experiment of Terwogt and Hoeksma (1995) shows that the most preferred color blue did not change in three different age groups (7 years, 11 years and 30 years old). In the research of Pitchford and Mullen

(2005), it is found that children's least preferred colors (brown and gray) are the ones that appear late in their conceptual development. According to this result, there could be a possible link between the color preference and color cognition of individuals. There is also another suggestion that color preferences of children are presented before correct color naming (Pitchford and Mullen, 2005), so that the relation between linguistic evolution of color terms and the organization of color perception in early childhood is another potential link of color preferences in young children (Zentner, 2001).

2.2. Color Associations

Researches of color associations provide enlightening knowledge about the meaning of color. Although color association is an important issue, most of the previous color studies are related with color preferences rather than associations. Osgood, May and Miron (1975: 328) defined color association with the help of four categories:

(a) concrete color identifications– names of things naturally (or normally) having a given color (e.g., white–chalk, black–night, red–blood, etc.) ; (b) concrete color associations–name of things culturally associated with a given color (e.g., black–necktie, red–sacrifice, yellow–plague); (c) abstract color associations–terms for non-‘ point-at-ables’ which can only have color metaphorically (e.g., grey-Monday, blue–eternity, red–patriotism); (d) abstract color symbolism–culturally significant concept which certain colors ‘stand for’ or represent traditionally but not in any obvious way metaphorically (e.g., colors associated with castes in India, with certain deities, religions, etc.).

Additionally, some cultural differences exist in individuals' color associations. The most common difference is that white is the color of mourning in Asian cultures, whereas black is the color of mourning in western cultures.

Such as color preferences, researches also question the effect of culture, age and gender on color associations, so that in the following section color association is examined in relation to culture and demographic variables.

2.2.1. Culture and Color Associations

While interacting with different cultures, people may have some linguistic problems. In a cross-cultural relation, these difficulties in association differences could also be seen during communication. Kitao and Kitao (1986) claim that communicating problems related to color is important, although some color associations are shared, people may not be familiar with color associations as good as natives.

Kaya and Crosby (2006) claim that traditions of different cultures can affect the associations of certain colors with certain emotions. According to Kitao and Kitao (1986), cultural differences of color associations exist, since Americans are more aware of color and have more associations related to colors than Japanese. Similarly, Chan and Courtney (2001) found that color

associations of Hong Kong Chinese differ from other populations (Yunnan Chinese and US subjects).

2.2.2. Demographic Variables and Color Associations

On the contrary of adults, children are exposed to a lesser amount of cultural conditioning, so it is expected to provide to reduce the impact of culture on color associations (Lawler and Lawler, 1965). Based on this opinion, most of the researches focused on children's color associations. Lawler and Lawler (1965) claim that nursery-school children have color-emotion associations since they associated brown with sad mood and yellow happy mood.

Similarly, Karp and Karp (2001) found a definite color association with the stimuli among children. Children's color-emotion associations turn into a differentiated and complex structure when their age increases (Boyatzis and Varghese, 1994). In the study of Byrnes (1983), age range of children is higher than previous studies and it was found that color associations of older children were very similar to adults' associations. Findings of Hemphill (1996) confirm this claim, similar to children, adults' emotional associations are positive for all colors in general.

In addition to age, gender was also examined in previous researches. Colors contain gender related information with reflecting traditional gender stereotypes (Boyatzis and Varghese, 1994). Pink associates with girls and

blue associates with boys. Since the number of studies about color associations is limited, the relation between gender and color association is unclear. Karp and Karp (2001) and Lawler and Lawler (1965) could not find a certain distinction between male and female subjects. On the other hand, Boyatzis and Varghese (1994) and Hemphill (1996) showed that female subjects react more positively to bright colors and more negatively to dark colors than male subjects.

Additionally, researchers support that individuals own personal experiences could play role on color associations of them. The statements of the subjects in the studies of Boyatzis and Varghese (1994), Kaya and Epps (2004), Kaya and Crosby (2006) indicate the reflection of past experiences on color associations.

3. THE EFFECTS OF ATMOSPHERICS ON RETAIL SPACES

To examine the effects of atmospherics, firstly the term 'atmospherics' is defined and described with its variables in this chapter. Secondly, to make a link between this term and retail spaces, user assessment in restaurants are studied.

3.1. Atmospherics

Individuals spent most of their times in men made environments. Until 1960's psychologists disregarded the effects of physical environment on human behaviors (Bitner, 1992), but researches in environmental psychology concluded that the artificial physical environment has an impact on human behavior (Countryman and Jang, 2006).

In addition to that, Kotler (1973) claims that consumption behavior of individuals is also influenced by the physical environment so that users' purchase decisions are affected by the physical surrounding. Since shopping and consumption behavior are influenced by the environment, environmental psychologists claim that store environment can be used as a retailing tool (Aubert-Gamet and Cova, 1999). Baker, Levy and Grewal (1992)

have a similar opinion and moreover, they support that store environment could be used as an effective and powerful marketing tool, if retailers comprehend how to use it.

Kotler (1973) introduced the term 'atmospherics', to explain consciously designed consumer settings such as retail spaces to obtain certain effects on buyers. In the last three decades, more than sixty experiments were done to examine the relation between atmospherics and human behavior. Content of the term 'atmospherics' is developed and detailed by other researches (Berman and Evans, 1992, Bitner, 1992, Turley and Milliman, 2000). The process of the development of this term is explained in the following section.

3.1.1. Definition and Variables

There are researches to develop the term 'atmospherics' and explain it with different variables. According to Kotler (1973), who is one of the pioneers of this field, "atmospherics is the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (p. 50). Atmosphere of a space is understood by the senses, so that the main four sensory channels (sight, sound, scent and touch) are the categories of atmospheric dimensions. Kotler (1973) concludes that color, brightness, size and shapes are the visual dimensions; volume and pitch are the aural dimensions, scent and freshness are the olfactory dimensions;

softness, smoothness and temperature are the tactile dimensions of an atmosphere.

After two decades, Bitner (1992) developed a conceptual framework and replaced the term 'atmospherics' with 'servicescapes' for describing how physical environment affects both consumers and employees in service settings where both of them play active and important roles. In this research, environmental dimensions of the servicescapes were divided into three categories: ambient conditions, spatial layout and functionality, and signs, symbols and artifacts. Ambient conditions contain background characteristics (e.g. temperature, lighting, noise, music, scent) of the environment. Spatial layout and functionality means the arrangement, size, shape and performance of machinery, equipment, and furnishing of the environment. Signs, symbols and artifacts are explicit or implicit communicating tools of an environment.

Berman and Evans (1992) focus on the term 'atmospherics' from a slightly different point of view. They link the term with store and/ or firm image. According to their opinions, atmospherics could be divided into four key elements: exterior, general interior, store layout and displays (see Table 1). If the case is a store-based retailer, atmospherics would develop an image and would be formed using those four key elements. But, if the case is a nonstore-

based retailer, the physical attributes of different factors such as catalogs and vending machines would influence the retailers' image. Since this case is a store-based retailer, atmospherics influence its image directly.

Table 1. The elements of atmosphere

1. EXTERIOR	
a. Storefront	g. Visibility
b. Marquee	h. Uniqueness
c. Entrances	i. Surrounding stores
d. Display windows	j. Surrounding area
e. Height of building	k. Parking
f. Size of building	l. Congestion
2. GENERAL INTERIOR	
a. Flooring	j. Vertical transportation
b. Colors	k. Dead areas
c. Lighting	l. Personnel
d. Scent and sound	m. Self-service
e. Fixtures	n. Merchandise
f. Wall textures	o. Prices (levels and displays)
g. Temperatures	p. Cash register placement
h. Width of aisles	q. Technology/ modernization
i. Dressing facilities	r. Cleanliness
3. STORE LAYOUT	
a. Allocation of floor space for selling, merchandise, personnel, and customers	d. Space/ merchandise category
b. Product groupings	e. Department location
c. Traffic flow	f. Arrangements within departments
4. INTERIOR (POINT-OF-PURCHASE) DISPLAYS	
a. Assortment	e. Cut cases and dump bins
b. Theme-setting	f. Posters, signs and cards
c. Ensemble	g. Mobiles
d. Racks and cases	h. Wall decorations

Source: Berman and Evans (1992, p.463).

Turley and Milliman (2000) reviewed the literature on about atmospheric effects on shopping behavior. Framework of their study is based on Berman and Evans (1992) point of view, but they believe that there should be a fifth variable- human variable- to complete the term 'atmospherics'. In retail spaces, users interact with their environments. Atmospheric variables construct responses in users, but these responses could vary from individual to individual or group to group. In addition to that, atmospheric variables affect the interaction of both users and employees with the store environment. Due to these reasons, a fifth category involving human behavior is designed. Furthermore, Turley and Milliman (2000) add more details to the content of atmospheric variables (see Table 2).

In this study, their categorization is used as the basis of analysis. The following section explains the details of these categories.

Table 2. Atmospheric Variables

1. EXTERNAL VARIABLES

- | | |
|-----------------------------|---------------------------|
| a. Exterior signs | h. Lawns and garden |
| b. Entrances | i. Address and location |
| c. Exterior display windows | j. Architectural style |
| d. Height of building | k. Surrounding area |
| e. Size of building | l. Parking availability |
| f. Color of building | m. Congestion and traffic |
| g. Surrounding stores | n. Exterior walls |

2. GENERAL INTERIOR VARIABLES

- | | |
|---------------------------|-------------------------|
| a. Flooring and carpeting | h. Width of aisles |
| b. Color schemes | i. Wall composition |
| c. Lighting | j. Paint and wall paper |
| d. Music | k. Ceiling composition |
| e. P.A. usage | l. Merchandise |
| f. Scents | m. Temperature |
| g. Tobacco smoke | n. Cleanliness |

3. LAYOUT AND DESIGN VARIABLES

- | | |
|--------------------------------|-------------------------|
| a. Space design and allocation | h. Waiting rooms |
| b. Placement merchandise | i. Department locations |
| c. Grouping of merchandise | j. Traffic flow |
| d. Work station placement | k. Racks and cases |
| e. Placement of equipment | l. Waiting queues |
| f. Placement of cash register | m. Furniture |
| g. Waiting areas | n. Dead areas |

4. POINT-OF-PURCHASE AND DECORATION VARIABLES

- | | |
|-------------------------------|-----------------------|
| a. Point-of-purchase displays | f. Artwork |
| b. Signs and cards | i. Product displays |
| c. Wall decorations | j. Usage instructions |
| d. Degrees and certificates | k. Price displays |
| e. Pictures | l. Teletext |

5. HUMAN VARIABLES

- | |
|-----------------------------|
| a. Employee characteristics |
| b. Employee uniforms |
| c. Crowding |
| d. Customer characteristics |
| e. Privacy |
-

Source: Turley and Milliman (2000, p. 194)

3.1.1.1. External Variables

Exterior signs, landscaping, parking, entrances and the surrounding area of store are the examples for the external variables (Turley and Milliman, 2000). In the literature, there are a few researches about external variables. One of them is about the prototypicality of retails' exterior and interior environments (Ward, Bitner and Barnes, 1992). It is found that external environmental attributes are more important than internal environmental attributes of fast food restaurants and help to classify the store. Another research explains that exterior window displays of clothing retailers affect consumers' entry and purchase decisions. (Sen, Block and Chandran, 2002). On the other hand, Kim and Moon (2009) claim that both exterior decoration and interior design of restaurants are important and they should meet customers' expectations.

3.1.1.2. General Interior Variables

General interior variables consist of ambient features of a retail space such as lighting, music, scent, temperature and color schemes. These variables are the most frequently studied ones in the field and the findings of the previous researches about interiors indicate that interior variables influence user preference and behavior (Turley and Milliman, 2000).

It is known that ambience of a retail store has an impact on users. Ryu and Jang (2008) support this opinion with the results of their research showing that ambience of a retail store is a significant factor for affecting users' emotions such as pleasure. Kim and Moon (2009) also found a similar result, according to their study, perceived service quality and feeling of pleasure are associated with ambience of retail spaces. Ambient conditions of a space are appreciably linked with users' emotion to that space; so that if the quality of ambient environment is low, the social environment of a retail space becomes more important than before (Baker, *et. al.*, 1992).

Although there is a rich lighting literature, researches relating lighting to atmospherics are limited. Lighting is an important issue in retail spaces since it either emphasizes or understates the product, its quality and its environment.

Researches verify the impact of lighting in store environments; shoppers are provoked to visit store, stay longer and make a purchase in better-illuminated stores (Summers and Hebert, 2001). In addition to that, lighting also influences users' mood, emotional states and behaviors. For example, bright light contributes liveliness and sociability to an atmosphere, whereas dim light creates romantic moods on users (Heide and Grønhaug, 2006).

Users' consumption behavior is also affected by supplemental lighting treatments of a retail space (Summers and Hebert, 2001). Park and Farr (2008) state that previous researches about user behavior deal with the quantity of light rather than the quality of light. They realize this lack and compare user behaviors from different cultures with different color quality of light. They found that culture also plays a role on users' behaviors in retail settings with different lighting conditions. On the other hand, Areni and Kim (1994) conclude that lighting does not affect users' consumption behaviors. In their research, brighter lighting of a wine store causes more examination and handling of wines, but has no effect on the sales of wines.

Scent is another variable that is used to attract and affect users in retail spaces. Although there are various studies about scent as an atmospheric element, most of them are related with gastronomy. Heide and Grønhaug (2006) state that retailers know how to take advantage of scent, such as Danish bakeries direct the ventilation system onto the street to attract customers. Coffee shops fascinate users with their irresistible coffee aroma. Since scent has an impact on user behaviors, length of time and the amount of money spent are positively affected by scent as indicated in some researches (Heide and Grønhaug, 2006). But, this impact varies with the density of retail environments. In the research of Michon, Chebat and Turley (2005) when the density condition is medium, consumers' cognition as well

as their behavior is affected. Not only the aroma of scent, but also the air quality of a retail setting is an essential element in general interior variables (Heide and Grønhaug, 2006).

The last general interior variable is music. Most of the previous studies searched the effects of music on user behavior and perception in restaurant settings. Generally, tempo, volume and types of music are examined in these researches (Caldwell and Hibbert, 2002; Sullivan, 2002; Wilson, 2003). It is known that background music of a retail space affects the interaction between buyers and sellers (Dubé, Chebat and Morin, 1995). The study of Sullivan (2002) is an example for this opinion. It shows that playing music at a low volume in restaurants increases range of expenditure. On the other hand, tempo has no impact on expenditure. But, tempo of music in restaurants affects time perception of users (Caldwell and Hibbert, 2002). In addition to volume, type of music also affects the users' consumption behavior. When the music is slow users' spending on food and drink increases (Caldwell and Hibbert, 2002, Sullivan, 2002). North, Hargreaves and McKendrick (1999) claim that the type of music could activate related knowledge and affect customers' decisions for a product. Furthermore, Wilson (2003) concludes that different types of music also influence the perception of atmosphere.

Retailers should consider the variety of user characteristics of a store, since different types of users are affected by different types of music. Heide and Grønhaug (2006) support that retailers could utilize music to attract certain customer segments, so that if the characteristics of users vary, “the range of music played in the restaurant should account for the varying tastes of the different customer segments” (Caldwell and Hibbert, 2002, p. 913).

3.1.1.3. Layout and Design Variables

Layout and design variables include variables such as space design and allocations, placement of merchandise and equipments, department locations, furniture (see Table 1). But, numbers of studies that are focused on this topic are highly limited. In retail settings, “layout means the way in which objects (e.g. machinery, equipment, and furnishings) are arranged within the environment” (Ryu and Jang, 2008, p.1155). In addition to that, the arrangement and design of seats, aisles, hallways and walkways, food service lines, restrooms, entrances and exits form restaurant layouts (Kim and Moon, 2009).

In the literature, it is claimed that design of an environment has an impact on consumer behavior and perception (Heide and Grønhaug, 2006). Smith and Burns (1996) support this idea with their research results. They found that layout of a warehouse grocery store influences consumers’ price perceptions.

Like perception, behavior is also affected by the store layout because when users are familiar with the layouts (especially in franchise operators), the probability of customer interaction and participation to service facilities increases (Heide and Grønhaug, 2006).

3.1.1.4. Point-of-Purchase and Decoration Variables

Point-of-purchase and decoration variables consist of variables such as displays, signs and cards, wall decorations, artworks (see Table 2). Quelch and Cannon-Boventre (1983) state “manufacturers are discovering the need to reach potential buyers directly at the time and place at which the buying decision is made- the point of purchase” (p. 162). Retailers could change this need to an advantage. By this way, the displays of point of purchase provide information to users, influence store atmosphere and have an advertising role (Berman and Evans, 1992).

In the literature, displays are the most frequently studied point-of-purchase variable. Gagnon and Osterhaus (1985) claim that displays are effective because users need something to increase speed and accessibility at the point-of-purchase. It is claimed that well-designed displays answer the needs of both retailers and users (Quelch and Cannon-Boventre, 1983). The research of Gagnon and Osterhaus (1985) supports this claim with the existence of the effect of displays on the number of product sold. Moreover, displays keep

users' busy and distract their attention so that they could wait longer. Users' sensitivity to promotions and prices increases when displays are used in retail stores (Bawa, Landwehr and Krishna, 1989).

In addition to displays signs, symbols and artifacts serve as signals that communicate store environment with their users (Heide and Grønhaug, 2006). Mckinnon, Kelly and Robinson (1981) state that presence of signs increase sales over a no-sign condition, so that the lack of signs is a disadvantage for retailers.

3.1.1.5. Human Variables

The deficiency of human factor in atmospheric variables directs Turley and Milliman (2000) to define a fifth category. This category consists of five variables: employee characteristics, employee uniforms, crowding, customer characteristics and privacy. According to Turley and Milliman (2000), this category could be divided into two: the effect of users and the effect of retail employees on shopping behavior.

Although Berman and Evans (1992) do not use the term human variables, it is known that human variables play an effective role in retail stores more than estimated. When a retail store is weak in terms of social environment, then the ambient factor becomes more important than before (Baker, *et. al.*,

1992). According to Wall and Berry (2007), in an ideal condition both human based and physical based clues of retail store should deliver a consistent message to users, but if there is an inconsistency, it will be better to be good in human based clues.

Retailers should regard the importance of employee characteristics, as well as customer characteristics. Employees play a critical role between retail store and customers during their interactions and decision making process (Yıldırım, 2005). According to Ryu and Jang (2008), if retailers want to obtain certain customer emotions, they should pay attention to the employees when hiring them.

When retailers define the profile of target users, they should consider the characteristics of users. The reason of this is that when the target users are varied, the atmospheric decisions become more complex (Kotler, 1973). The variation of demographic features of users affects user perceptions of atmosphere (Heide and Grønhaug, 2006). Previous researches (Yıldırım, 2005; Yıldırım, *et.al.*, 2007) indicated that the rise of age influence the users' perception negatively. The results may be depended on the user' past experience, generation differences and expectations (Yıldırım, 2005). In addition to age, gender is also another important issue and some perception differences occur between genders. Males perceive store atmospherics in a

more positive point of view than females, whereas females approach atmospherics with a more critical view (Yıldırım, 2005; Yıldırım, *et. al.*, 2007)

3.1.2. Color in Atmospherics

As it is mentioned before, color is defined under the general interior variables. Since this study searches the effect of color on retail stores, color in atmospherics is examined in more detail.

The number of researches about color as an atmospheric variable is limited, but the findings of those researches are remarkable. Generally color is used as a tool to reflect an image or to obtain a desired atmosphere of a retail space (Bellizzi, Crowley and Hasty, 1983). Research indicates that color could affect users' reactions, responses and attention and could attract users and influence their perception of store and merchandise image (Bellizzi *et. al.*, 1983). Singh (2006) states that up to 90 percent of the assessment depends on colors alone. According to Babin, *et. al.* (2003) color is isolated from other factors while searching retail stores in previous studies, so that the interaction between color and other environmental features is neglected. In the study of Countryman and Jang (2006), the results show that color appears to be the most effective one between three significant physical elements (color, lighting and interior style).

As color could affect the users' assessment of a retail store, researches examining the effect of color categorize color into two: cool colors and warm colors. Cool colors include blue, green and purple, whereas warm colors include orange, red and yellow. To understand the effect of color, researchers usually compare cool and warm colors.

In general, cool colors have a positive impact on consumers. Users' evaluations of the store environment become more positive when wavelength moves from red to blue (Crowley, 1993). Cool colors are perceived more positively, retailers should use cool colors where higher-price and higher-risk exist, because cool colors increase confidence about purchasing and help users during the decision-making process (Bellizzi *et. al.*, 1983). Findings of other researches (Babin, *et. al.*, 2003; Yıldırım, *et. al.*, 2007) also demonstrate the existence of a more positive effect of cool colors on shopping behavior compared to warm colors.

On the contrary, warm colors cause negative perceptions and responses to retail environments. Subjects in different researches perceive warm colors as negative and tense (Bellizzi *et. al.*, 1983). Evaluation, excitement, price fairness, patronage and purchase intentions of users would decrease if the environment is warm-colored (Babin, *et. al.*, 2003). Although it seems that warm colors always affect users negatively, warm colors are evaluated better

in activity factor (Crowley, 1993). Thus, the appropriate place of warm colors is store windows, entrances and places where users purchase products with an unplanned behavior (Bellizzi *et. al.*, 1983). According to these findings, retailers should use warm colors where the impulse of buying and immediate purchasing are needed.

3.2. Assessment of Restaurants

The previous section showed that atmospheric variables affect users. In this section, how these variables affect users is examined. The term assessment shows how users perceive the environmental quality, service quality, product quality and price of a retail space.

It is known that environmental quality of a retail space causes certain emotions and behavioral intentions (Kim and Moon, 2009; Baker, *et. al.* (1992). They support that environmental quality of a retail store affects users' purchase decisions. In addition to these findings, Ryu and Jang (2008) question how these emotions and behavioral intentions change with the environmental elements of a retail space.

Atmospheric variables are not the only clues and signs for expected service and product quality (Reimer and Kuehn, 2005). They provoke some responses that influence users' evaluations and judgments on the quality of

the product or services (Kim and Moon, 2009). Moreover, atmospheric variables of a retail space affect service and product quality in both direct and indirect way (Reimer and Kuehn, 2005). In addition to atmospheric variables, environment of retail spaces has also impact on service and product quality (Michon, *et. al.*, 2005). Researches indicate that price and merchandise (depends on price) are affected by store atmospherics and environment such as color (Crowley, 1993), store layout (Smith and Burns, 1996) and customer characteristics (Guéguen and Petr, 2006). Nowadays, restaurateurs are not only looking for creating differences from other restaurants, they also benefit from color to get more profit (Singh, 2006).

Restaurants are both retail and service settings. This situation causes the responsibility to have the ability of influencing before and during customers experience the restaurants (Wall and Berry, 2007), because users look for clues to provide influence their expectations (Edwards and Gustafsson, 2008).

Since restaurants are classified as service settings, service quality of a restaurant is very important for its users and managers. Atmospherics are effective environmental clues that influence users' service perceptions by being part of their experiences (Wall and Berry, 2007). In addition to users' perceptions, their behaviors are also affected by atmospherics (Kim and

Moon, 2009). Previous researches show that light (Ryu and Jang, 2008), scent (Guéguen and Petr, 2006), table characteristics (Kimes and Robson, 2004), dining equipment and layout (Ryu and Jang, 2008) and human variables (Wall and Berry, 2007) affect users' assessment of and behaviors in restaurant settings. Because of being service settings, restaurateur should organized restaurants' atmospheric variables as a whole (Kim and Moon, 2009; Wall and Berry, 2007), they should not neglect the significant effect of human variables.

4. THE RESEARCH

This field study is done to explore the relationship between color and atmospherics of retail spaces. It aims to find out about the role of color on the assessment of restaurant atmospherics. In this chapter, objectives of the study, method of the study, results and discussion are explained.

4.1. Objectives of the Study

The aim of this study is to find out the effects of color on the assessment of restaurant atmospherics. How users evaluate different restaurants in terms of quality, price, type of customers and food are considered as influential factors on their assessment. Moreover, the impact of warm and cool colors is compared in this study. Since gender is an important issue in this field, the study regards differences of gender on assessments of restaurants in relation to color. The obtained results of the study are expected for be beneficial information to interior architects while designing retail spaces.

4.1.1. Research Questions

In order to find out the impact of color, the main question of this study is: Does color affect assessment of customers in retail spaces? Since color is

grouped into two (cool and warm colors) in this study, this research also asks if there are differences between these color choices in relation to the assessment of restaurant atmospherics? Additionally, does the assessment of restaurant atmospherics according to color differ along gender?

4.1.2. Hypotheses

This study has four main hypotheses:

1. Users' assessment differs with colors in restaurants.
2. Cool colors relate to higher quality in restaurants, whereas warm colors relate to lower quality.
3. Restaurant types affect assessment in terms of color choice.
4. The assessment of restaurant atmospherics according to color differs along gender.

4.2. Method of the Study

4.2.1. Sample Group

This study was designed as a survey type research using quota sampling (in terms of gender and department of subjects). Sample group of this study includes second, third and fourth grade students from the Department of Interior Architecture and Environmental Design at Bilkent University (IAED) (see Table 3). The total number of participants is 96; participants are equally distributed along gender. The mean age of participants is 22. The aim of

choosing subjects from the department of IAED is depended on the assumption that their educational background leads their judgments in a more critical point of view, since this research is related with spatial features of retail spaces. In addition to that, previous research (Zhang and Montag, 2006) found that appropriate training and knowledge could improve individuals' color distinctions.

Table 3. Distribution of the participants

Grades	Number of the Participants	Gender	
		Females	Males
2 nd Grade	14	2	12
3 rd Grade	55	35	20
4 th Grade	27	11	16
Total	96	48	48

4.2.2. Procedure

All participants were accepted in the same room which was illuminated only by the north oriented natural daylight, because minimum change occurs when the daylight comes from the north. Subjects were tested individually. Before they took the questionnaire, all participants had taken *Ishihara's test for color blindness* (Ishihara, 1975). If the subject did this test accurately, s/he was given the questionnaire. None of the participants had color blindness in this research. Participants filled the questionnaire on a surface that was painted

mid-gray, N 5.0/ in Munsell Book of Color Glossy Finish Collection (1991).

Eight selected color chips, the photograph of the specific restaurant and the questionnaire were located on that surface during the test.

In this research, a total of eight chips of basic colors were shown (see Figure 1). Since the effect of color may change from culture to culture, it was found appropriate to use the research of Şahin (1998) as the basis of color selection in this study. Şahin's (1998) research depends on color naming and color perception of Turkish people. According to this research, 322 participants from different regions of Turkey identified 8 basic and 24 non-basic color terms from Munsell Color System.

In this dissertation, basic color terms of Şahin's (1998) research were divided into two as cool and warm colors. So, similar chroma degrees of cool and warm colors that were significant in that research were chosen from Munsell Book of Color Glossy Finish Collection (1991) for this study (see Appendix A, Table A.1). Chroma degree of cool colors (blue, green, purple) is 12 and except brown, chroma degree of other warm colors (red, orange, yellow, pink) is 14 (see Table 4 and 5 respectively).



Figure 1. Chips of 8 basic colors

Table 4. Chosen chips for cool colors

Cool Colors	
Blue	10 B 5/12
Green	2.5 G 5/12
Purple	5 P 4/12

Source: *Munsell book of color: glossy finish collection*. (1991).

Table 5. Chosen chips for warm colors

Warm Colors	
Red	5 R 4/14
Orange	5 YR 7/14
Yellow	5 Y 8/14
Pink	7.5 RP 5/14
Brown	5 YR 4/8

Source: *Munsell book of color: glossy finish collection*. (1991).

Since this study compares the effect of color on the assessment of different restaurant types, restaurants that are located in Ankara were selected according to price range. Before the elimination, eleven restaurants from different price ranges were chosen, then three of them were selected for this study. Selection of these three restaurant types depends on their price ranges, furniture and decoration types, familiarity and location. These three restaurants are located in Çankaya district. It was intended to choose unfamiliar and unpopular restaurants for reducing the possibility of experiencing them because participants' color preferences could be affected by their previous knowledge about the restaurants. Since the assessment of different restaurant types are searched in this study, selection of furniture and decoration types are also important. According to this, the furniture and decoration types of these three selected restaurants are different from each other. Additionally, price ranges of restaurants were the criteria for grouping restaurant types as lower, middle and high classes.

The first restaurant is Bursa İnegöl Köftecisi which is a lower class restaurant at Cinnah Avenue (see Figure 2). The second one is Mum Restaurant which is a middle class restaurant at Reşit Galip Avenue (see Figure 3). The third restaurant is Niki which is a high class restaurant and located in Divan Hotel at Güniz Street (see Figure 4).

Name of the restaurants were not revealed to participants neither verbally nor visually during the test. Photographs showed a corner of each restaurant. To prevent the effectiveness of colors of restaurant interiors, the photographs of the interiors of the restaurants were shown in black and white 15x20 cm size.



Figure 2. Bursa İnegöl Köftecisi



Figure 3. Mum Restaurant



Figure 4. Niki

As it was mentioned before, the questionnaire that was used during this study was the same for all types of restaurants. To prevent a possible influence of getting familiar with the experience, sample group was divided into three groups. Each group had 32 subjects (16 males and 16 females) and one group was shown one photograph only, so that each group evaluated one restaurant type during the test. The questionnaire was prepared in subjects' native language Turkish. An English version was also given in the Appendix B.

4.3. Results

To analyze the obtained data from questionnaires, Statistical Package for the Social Sciences (SPSS) 15.0 was used. Frequencies, independent t-tests, ANOVA, Pearson Correlation and chi-square analysis were used for analyzing the data.

At first, findings that are related to color choices are explained in this part. The first finding of this research is that brown is the most and pink is the least preferred color in general ($df=7, p=,000$) (see Figure 5) (see also Appendix C, Table C.1). The results show that warm colors are preferred more than cool colors regardless of restaurant types ($df=1, p=,000$) (see Figure 6) (see also Appendix C, Table C.2).

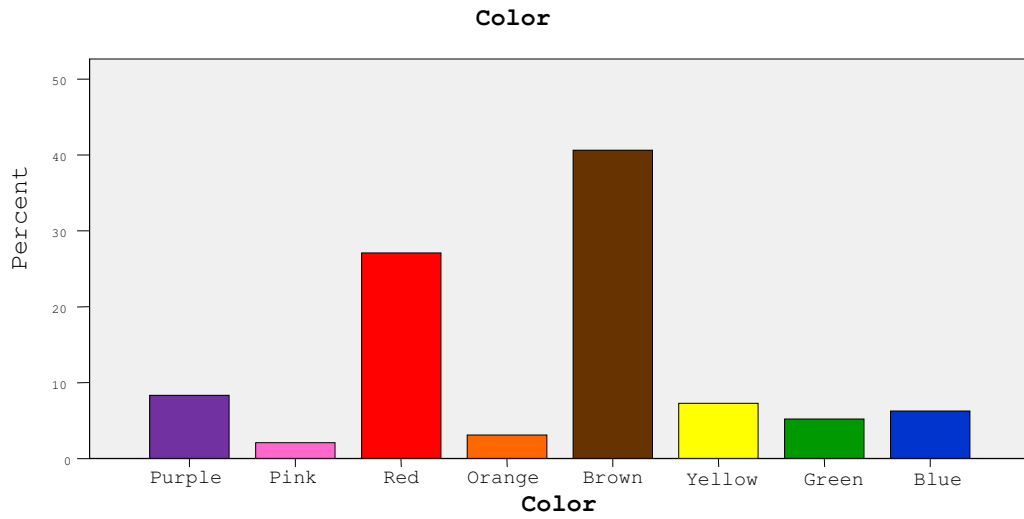


Figure 5. Distribution of color preferences

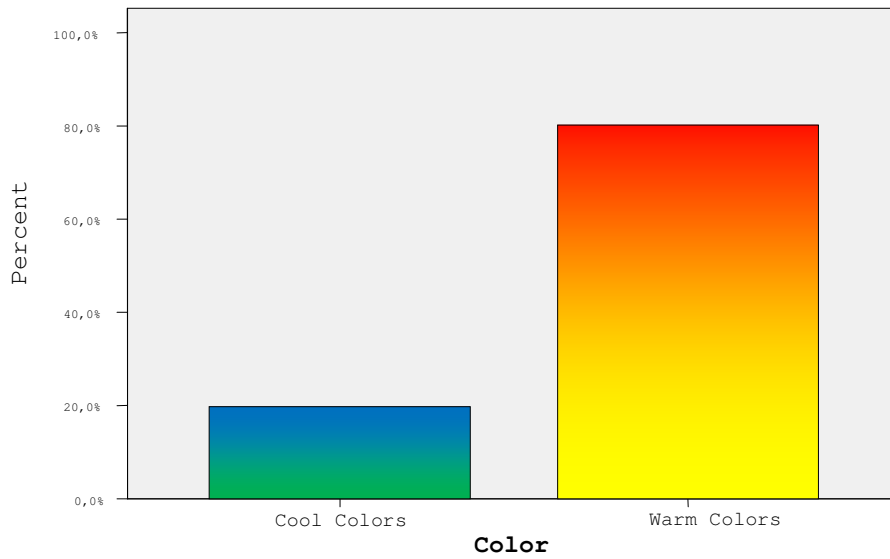


Figure 6. Cool and warm color preferences

As oppose to the expectations, there is not a significant difference in color preferences between restaurant types according to the ANOVA test ($df=2$, $p=,198$) (see Appendix C, Table C.3). But, chi-square test shows that there is

a significant relationship between preferred color and price ($df= 2, p=,009$) (see Appendix C, Table C.4). According to this finding, when the preference of warm color increases, range of price decreases (see Figure 7). This result supports findings of previous research.

T-test results indicate that there is not a significant relationship between color preference and gender ($df=94, p=,448$) (see Figure 8)(see also Appendix C, Table C.5). A significant relationship could not be found between gender and evaluation of price ($df=92, p=,655$) (see Appendix C, Table C.6).

Similarly, t-test results show that there is not a significant relationship between gender and time spent in the restaurants ($df=92, p=,890$) (see Appendix C, Table C.7).

Results of chi-square tests conclude that there is not a significant relationship between preferred color and users' spent time in restaurants ($df=2, p=,994$) (see Appendix C, Table C.8). The time range between 31 to 60 minutes is the most chosen one for all types of restaurants. Color does not play statistically significant role on users' spent time in restaurants.

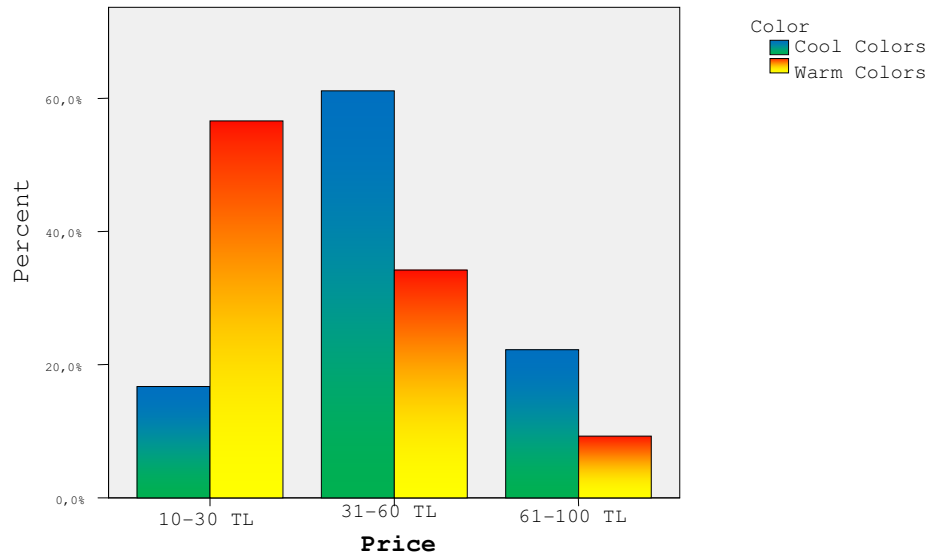


Figure 7. Color preferences according to price

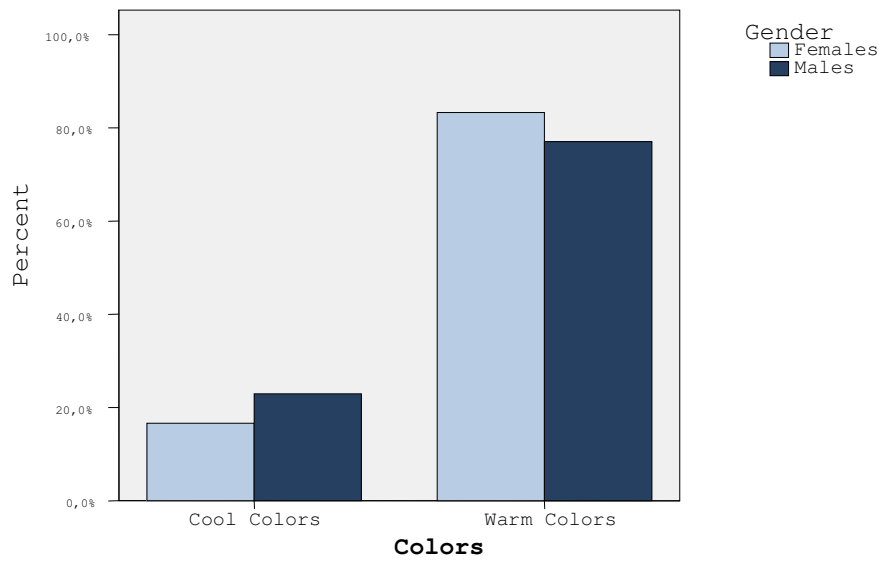


Figure 8. Color preferences according to gender

The selected areas for applying preferred color are grouped into three: structural areas (walls, floor and ceiling), non-structural areas (furniture and decorative elements) and both structural and non-structural, since

participants were free to select more than one choice in this question. According to this grouping, participants may choose one or more than one area in a group or may select areas that belonged to both groups. Findings show that there is not a significant difference between these three groups to apply their preferred color ($df=2, p=,334$) (see Figure 9) (see Appendix C, Table C.9). In addition to these, the results show that there is not a significant correlation between the selected area for applying color and color preferences ($df=2, p=,592$) (see Appendix C, C.10).

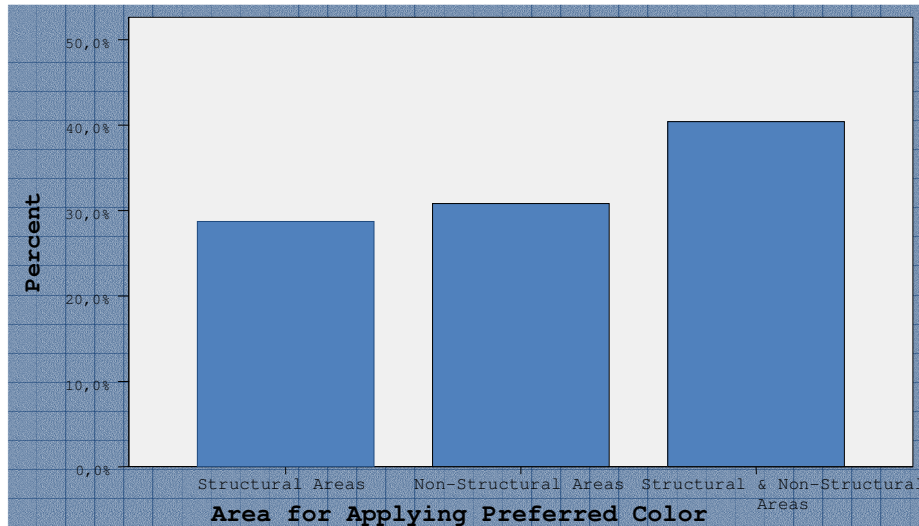


Figure 9. Selected area for applying the preferred color

To find out reasons for preferring colors, participants responded an open-ended question in the questionnaire. When their answers were analyzed and examined, it was found that answers could be divided into three groups. According to these, the reasons may depend on the materials used in the restaurant, spatial features of the restaurant or participants' personal

opinion. The results indicate that participants refer to their personal opinion at most ($df=2$, $p=.000$) (see Figure 10) (see Appendix C, Table C.11).

Participants express their opinions with different statements such as “green color that came from nature, makes cheerful”. Like green, orange was also referred to as cheerful. As it is expected, red was a warm color and reminded them food, meat and/or hunger. In addition to these, yellow evokes the feeling of comfort to participants and creates a plain atmosphere.

Participants stated purple as an elegant color as a color that makes people royal (asil) who wants to be royal. On the other hand, according to the participants, brown that is preferred at most has a formal, but not an apparent style. Like brown, blue has also a formal style with a positive tranquility effect. In addition to their personal opinions, spatial features also direct participants’ reasons for preferring color. Participants stated design and color of furniture, ambience of the space (classic, gloomy, boring, not lively), clothing of the upholsteries and paintings as spatial features of the space in this open-ended question. The least rated reason is the materials used in the space. In general, participants stated that brick wall and wood furniture and/or flooring affect their decisions while choosing color.

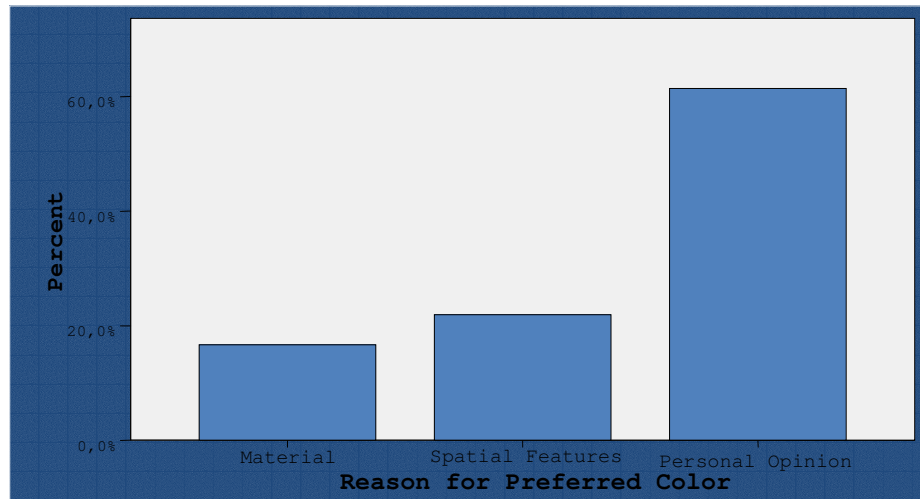


Figure 10. Reasons for preferred color

To find out possible factors and associations that may affect color preferences of participants, some questions were asked to the sample group. The first question was related to the type of cuisine that was being served in displayed restaurant according their opinions. The findings indicate that participants rated mixed type of cuisine at most ($df=5$, $p=,000$) (see Figure 11) (see Appendix C, Table C.12). But there is not a significant correlation between cuisine type and color preferences ($r=,015$, $df=94$, $p=,884$) (see Appendix C, Table C.13). In addition to the cuisine type, participants mostly preferred dinner as an activity for all those three restaurant types ($df=5$, $p=,000$) (see Figure 12) (see Appendix C, Table C.14). The analysis shows that there is not a significant correlation between type of activity and color preferences of individuals ($r=-,092$, $df=94$, $p=,378$) (see Appendix C, Table C.15) .

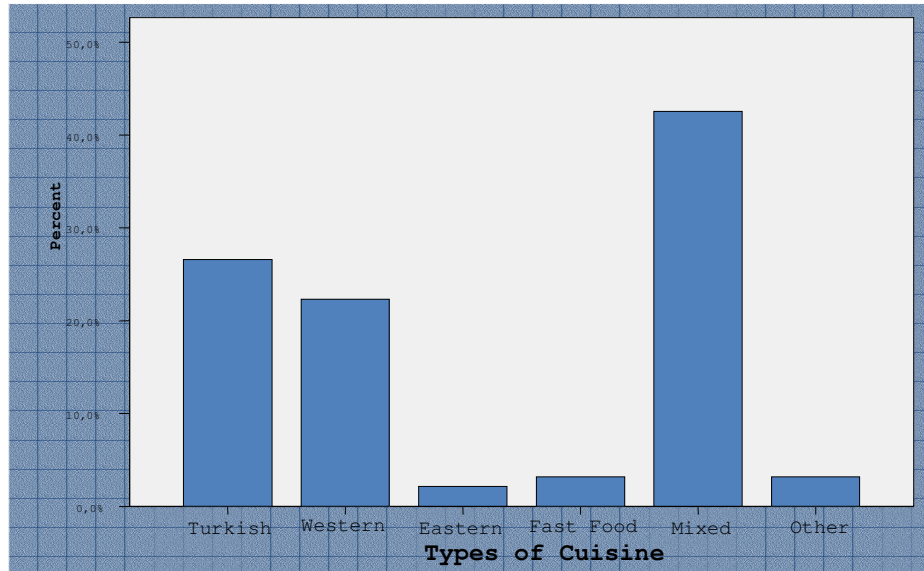


Figure 11. Distribution of preferred cuisine type

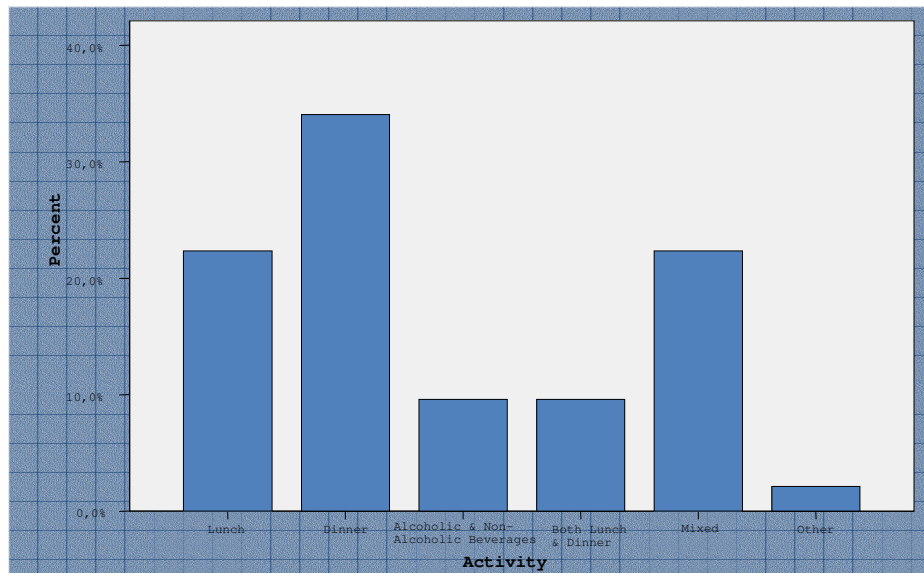


Figure 12. Distribution of preferred activity type

User characteristics of these three restaurants may affect participants' color preferences so that to investigate these possible associations participants answered questions that were related to assumed users. Although all of the

participants were students in a university, all of them rated users as working people ($df=2, p=,000$) who are middle-aged ($df=2, p=,000$) and middle-class ($df=2, p=,000$) (see Figures 13-15) (see Appendix C, Table C.16-C.18)

Participants imagined users of restaurants wear casual clothes at most ($df=1, p=,000$) (see Figure 16) (see Appendix C, Table C.19). Except the work status of assumed users ($r=,229, df=94, p=,026$), there are not any significant correlations between color preferences of participants and assumed users' age ($r=-,049, df=93, p=,644$), income levels ($r=-,184, df=94, p=,075$), clothing ($r=-,122, df=94, p=,241$) (see Appendix C, Table C.20-C.23).

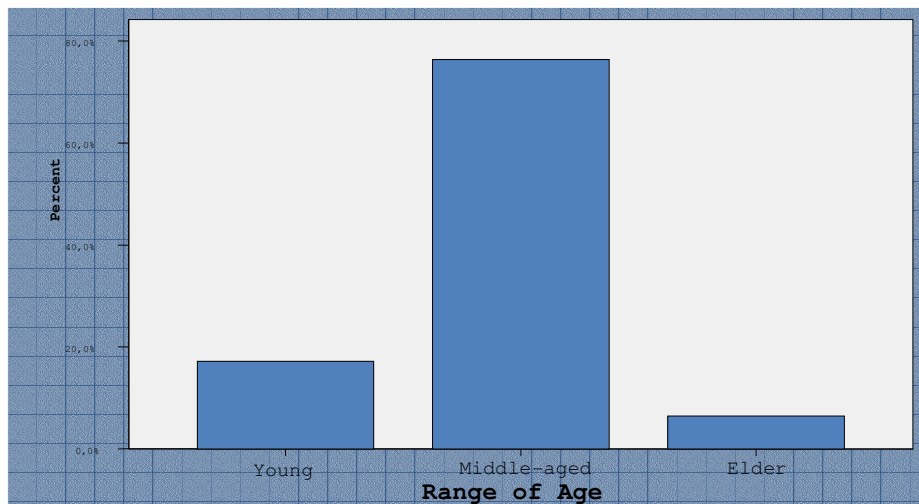


Figure 13. Distribution of age of the users

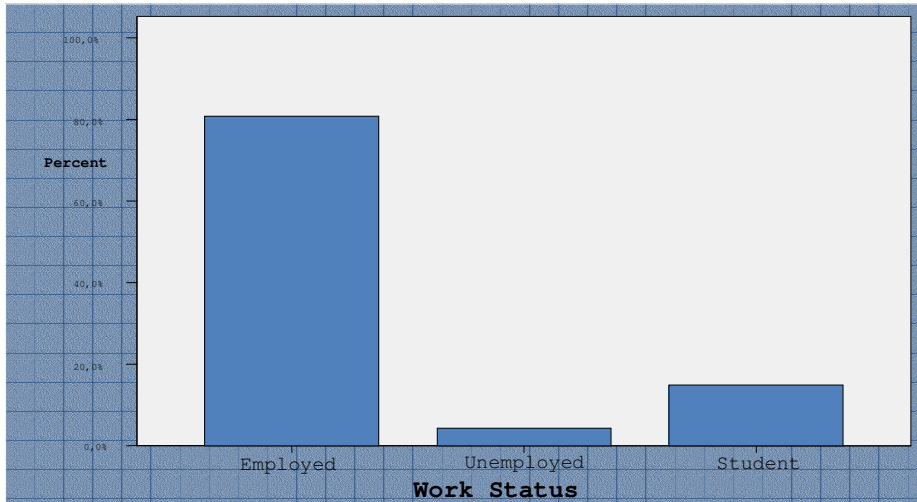


Figure 14. Distribution of work status of users

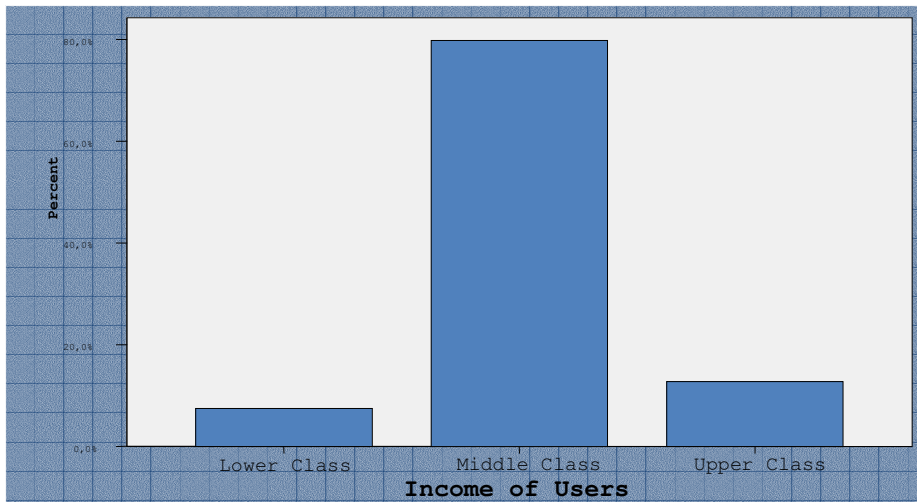


Figure 15. Distribution of users' income

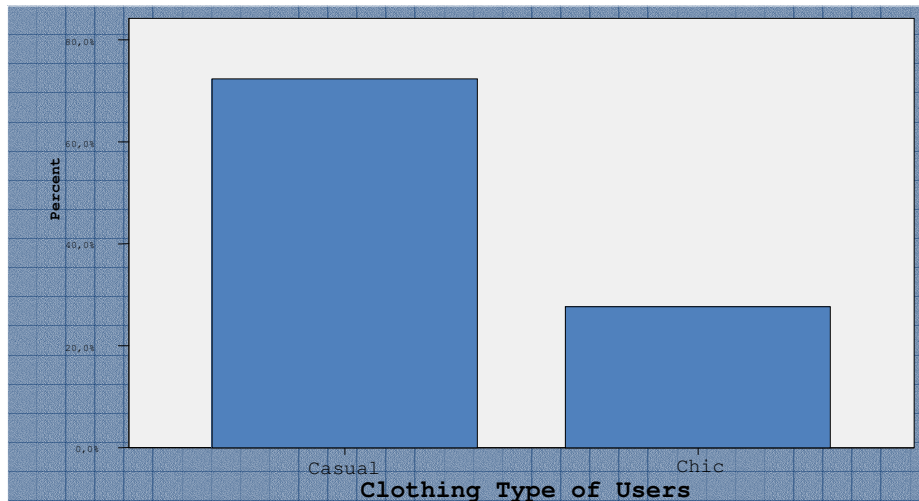


Figure 16. Distribution of users' clothing type

Answers that are related to accompanying people are grouped into four: people who go to the restaurant with only their families, only their friends, only their co-workers and with more than one of these groups of people. The results indicate that participants chose more than one type of accompanying people in restaurants ($df=3, p=,000$) (see Figure 17) (see Appendix C, Table C.24). Findings could not indicate a significant correlation between assumed accompanying people and color preferences of participants ($r=,088, df=94, p=,399$) (see Appendix C, Table C.25).

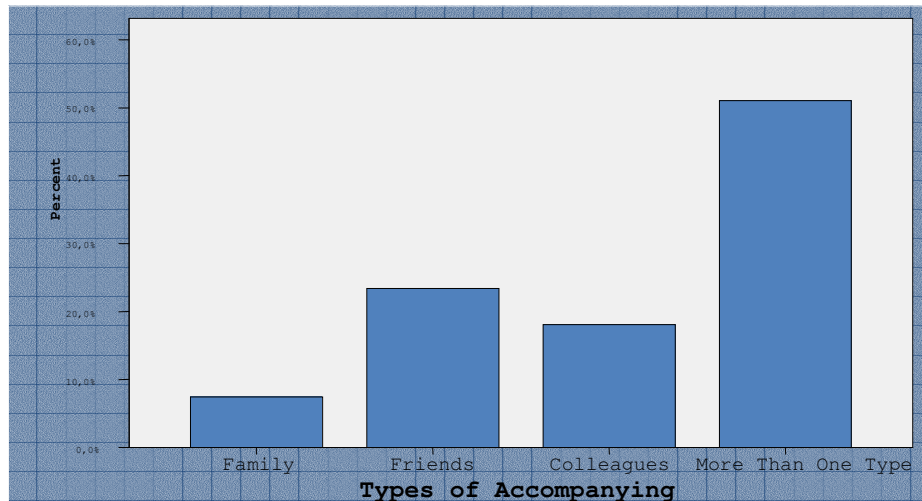


Figure 17. Distribution of accompanying people

4.3. Discussion

In this research, the effect of color on the assessment of restaurant atmospherics was examined. The results of the study show that brown is the most and pink is the least preferred color in general. Preferences of brown may depend on the material association since participants stated the influence of wood furnishing. The distribution of color preferences indicates that participants preferred warm colors more than cool colors in this research.

Previously, it was hypothesized that users' assessment differs with colors in restaurants. It was expected that cool colors make people to spend more time in restaurants. Because it is known that designers use blue to calm and relax

their customers in formal restaurants, by this way they spend more time (Singh, 2006). But, the results indicate that there is not a significant relationship between color and users' spent time in restaurants. It means that there is not a difference between the effect of cool and warm colors on the time spent in restaurants. Except the users' clothing type, there are not any significant correlations between participants' color preferences and assumed users' of restaurants.

Another hypothesis that was mentioned before was related to color and range of price. The results support this opinion and show that when the preference of warm color increases, expected range of price decreases. Since price could be linked with quality, it can be said that cool colors relate higher ranges of quality in restaurants, whereas warm colors relate to lower ranges of quality. This finding also supports previous researches that are related to atmospherics and colors (Crowley, 1993; Bellizzi *et.al.*, 1983; Babin *et.al.*, 2003, Yildirim *et.al.* 2007).

The third hypothesis was about the relation between restaurant types and users' assessment in terms of color preference. It was expected that when the type of restaurant changes, the color preference of participants changes too. It was assumed that when the type of restaurants is close to lower price ranges, the preference of colors tends to be close to warm colors rather than

cool colors. But the ANOVA results do not show a significant relation between restaurant types and color preferences in this study.

The last hypothesis was related to the gender difference in users' assessment of restaurant atmospherics according to color. It is known that females approach retail spaces with a more critical point of view than males (Yıldırım, 2005; Yıldırım, *et.al.*, 2007). Because males perceive and evaluate retail spaces more positively, in this study it was claimed that gender differences might occur during the research. On the contrary of the expectations, there was not a significant relationship between gender and color preference. In addition to that relationships between gender and price, gender and time spending were not found significant in this research.

5. CONCLUSION

The effect of color on the assessment of retail spaces was examined in this study. Restaurants are retail spaces where people choose with their own free wills, so that the relation between color and restaurant atmospherics was searched in detail with a field research in the Department of Interior Architecture and Environmental Design at Bilkent University. Educational background and gender were regarded during the research. To question the effect of warm and cool colors on the assessment in restaurants, statistical analyses were also applied.

To investigate the relation between physical environment and color, color preference and color associations were searched in this study. In the literature, it was found that culture may affect individuals' color preferences (Madden *et.al.*, 2000; Ou *et.al.*, 2004b; Manav, 2007). But in some researches (Cernovsky *et.al.*, 1998; Dittmar, 2001), there is not a significant relation between color and culture. Demographic variables such as gender (Ellis and Ficek, 2001; Lange and Rentfrow, 2007; de Destefani and Whitfield, 2008), age (Dittmar, 2001; Zentner, 2001; Manav, 2007) play significant role on individuals' color preferences. Although researches about color associations

are highly limited, previous studies found that culture influences individuals' color associations (Kitao and Kitao, 1986; Chan and Courtney, 2001; Kaya and Crosby, 2006). In the literature, most of the age-related studies concerned with children's color associations (Lawler and Lawler, 1965; Byrnes, 1983; Boyatzis and Varghese, 1994; Karp and Karp, 2001). Since the number of researches that are related to color associations is limited, the relation between gender and color associations is unclear.

In the literature, atmospherics is divided into five variables as external variables, general interior variables, layout and design variables, point-of-purchase and decoration variables, human variables. Since this study explored the relation between color and atmospherics, the role of color on restaurant atmospherics were explained in detail. It was found that cool and warm colors affect user perception in retail spaces in different ways (Bellizzi *et.al.*, 1983; Countryman and Jang, 2006; Crowley, 1993; Babin *et.al.*, 2003; Yildirim *et.al.*, 2007). To investigate the effects of color, eight basic colors were grouped as cool and warm colors in this study and their relation with restaurant atmospherics were searched.

By using previous studies as a guideline, this study found some significant results. According to the results, it was found that warm colors are preferred more than cool colors in general. In addition to that, color affected price

judgments of individuals. While participants choosing colors, they mostly referred to their personal opinions and selected both structural and non-structural areas for applying their preferred color. But, color is not found to be an effective factor on the time spent in restaurants. Contrary to the expectations, there were not any significant relationships between gender and color preferences, gender and price, gender and time spent.

This study is expected to contribute to the research on atmospherics as a part of the environmental psychology. In addition, interior architects are assumed to satisfy both retailers' and users' expectations in retail spaces. This study might be beneficial for satisfying these expectations through giving information on color choice of users. The findings of this research could be used while designing and coloring such retail spaces.

Limitation of this study is using 8 basic color terms rather than basic colors of a color system, because it is known that brown and pink are not basics of a color system. In addition to that, the number of warm colors is more than cool colors, which may cause distortion in favor of warm colors. Thus, the results should be tested in the future research.

Participants were the students of a design based department in this study, thus, it was expected that they could visualize photographs in their preferred

colors. But, in future studies, photographs could be colored with simulation techniques rather than being used in black and white scale. Furthermore, research in real settings could be more fruitful for participants during the evaluation of the retail space. In this research, the profession of participants may be influential on removing the assessment differences between female and male subjects. Additionally, age range of the participants did not vary widely. For future researches professions and age of the participants could diversify to observe differences in color preferences in different user groups.

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APPENDICES

APPENDIX A

Table A.1 Significantly selected color chips for eight basic color terms in Şahin's (1998) research

Chroma Value	4	6	8	10	12	14	16
2				2.5 P 2/10			
3	5 YR 3/4 7.5 YR 3/4	5 YR 3/6 7.5 YR 3/6		2.5 P 3/10 5 P 3/10			
4		5 YR 4/6	5 YR 4/8 7.5 YR 4/8		2.5 P 4/12 5 P 4/12 5 PB 4/14	5 R 4/14	7.5 R 4/16
5					10 GY 5/12 2.5 GY 5/12 10 B 5/12 2.5 PB 5/12	7.5 RP 5/14	7.5 R 5/16
6					2.5 RP 6/12 5 RP 6/12 7.5 GY 6/12	10 R 6/14 2.5 YR 6/14	2.5 YR 6/16
7				5 RP 7/10		5 YR 7/14	
8		2.5 RP 8/6 5 RP 8/6 7.5 RP 8/6					2.5 Y 8/16
8.5						5 Y 8.5/14	

APPENDIX B

QUESTIONNAIRE IN ENGLISH

1. Have you ever been in this restaurant which is being displayed in the photo?
Yes No
If it is yes, please write the name of the restaurant.....

2. What is your gender?
Female Male

3. Your age.....

4. Your grade.....
How long have you been in this department?

5. Which cuisine is being served in this restaurant? (Feel free to select more than one)
Turkish Cuisine
Western Cuisine
Eastern Cuisine
Fast Food
Mixed
Other (please specify).....

6. What would be your event when you are in this restaurant? (Feel free to select more than one)

Lunch

Dinner

Hot and cold non-alcoholic beverages

Alcoholic beverages

Others (please specify).....

7. What do you think about the maximum price to pay for one person in this restaurant?

10-30 TL 31-60 TL 61-100 TL 101 and above,

8. What do you think about the range of users of this restaurant?

Young Middle-aged Elder Other (specify).....

Employed Unemployed Student Other (specify).....

9. What do you think about the users' income levels who are coming to this restaurant?

Lower

Middle

Upper

10. How should they dress when they are coming to this restaurant?

Sport

Casual

Chic

Why?.....

11. How long would you spend time in this restaurant?

- | | |
|-------------------|--------------------|
| Less than 30 min. | 31-60 min. |
| 61-120 min. | More than 120 min. |

12. With whom would you like to come to this restaurant? (Feel free to select more than one)

- | | | | |
|-------|-----------------------------|---------|------------|
| Alone | Family | Friends | Co-workers |
| Date | Other (please specify)..... | | |

13. Which color should be displayed as dominant in this restaurant?

- | | | | |
|--------|--------|-------|--------|
| Purple | Pink | Red | Orange |
| Brown | Yellow | Green | Blue |

Why?.....

14. The color that you chose before should be displayed specifically in which area? (Feel free to select more than one)

- | | |
|------------------------|------------------------------|
| On walls | On the floor |
| On the ceiling | On furniture |
| On decorative elements | Others (please specify)..... |

QUESTIONNAIRE IN TURKISH

1. Resimde gösterilen restorana daha önce gittiniz mi?

Evet Hayır

Evet ise, lütfen restoranın adını

yazınız.....

2. Cinsiyetiniz

Kadın

Erkek

3. Yaşınız:

4. Sınıfınız:

Kaç yıldır bu bölümdesiniz?.....

5. Sizce bu restoranda hangi mutfağa ait yemekler servis edilmektedir?

(Birden fazla seçebilirsiniz)

Türk mutfağı

Batı mutfağı

Doğu mutfağı

Fast food

Karışık

Diğer (belirtiniz).....

6. Bu restorana hangi tür etkinlik için gidersiniz? (Birden fazla seçebilirsiniz)

Öğle yemeği yemek için

Akşam yemeği yemek için

Çay/kahve/ içecek içmek için

İçki içmek için

Diğer (belirtiniz).....

7. Sizce bu restoranda bir kişi için ödenecek maksimum fiyat ne kadar olabilir?

10-30 TL 31-60 TL 61-100 TL 101TL ve üzeri

8. Sizce bu restorana ağırlıklı olarak ne tip insanlar gider?

Genç Orta Yaşlı Yaşlı Diğer

(belirtiniz).....

Çalışan Çalışmayan Öğrenci Diğer

(belirtiniz).....

9. Sizce bu restorana giden kişilerin gelir seviyesi aşağıdakilerden hangisidir?

Düşük Orta Yüksek

10. Sizce bu restorana giden kişilerin nasıl giyinmeleri uygun olur?

Spor Günlük Şık

Neden?.....

11. Siz bu restoranda en fazla ne kadar vakit geçirirsiniz?

30 dakikadan az 31-60 dakika
61-120 dakika 120 dakikadan fazla

12. Sizce bu restorana esas olarak kimlerle gidilir? (Birden fazla seçebilirsiniz)

Yalnız Aileyle Arkadaşlarla
İş arkadaşlarıyla Sevgiliyle Diğer
(belirtiniz).....

13. Sizce bu restoranda ana renk gösterilen renklerden hangisi olmalıdır?

Mor Pembe Kırmızı Turuncu
Kahverengi Sarı Yeşil Mavi

Neden?

.....

14. Sizce seçtiğiniz renk bu restoranda ağırlıklı olarak nerelerde kullanılmalıdır? (Birden fazla seçebilirsiniz)

Duvarlar Zemin Tavan
Mobilya Dekoratif elemanlar Diğer
(belirtiniz).....

APPENDIX C

Table C.1 Chi-square test for preferred basic colors

Color

	Observed N	Expected N	Residual
Purple	8	12,0	-4,0
Pink	2	12,0	-10,0
Red	26	12,0	14,0
Orange	3	12,0	-9,0
Brown	39	12,0	27,0
Yellow	7	12,0	-5,0
Green	5	12,0	-7,0
Blue	6	12,0	-6,0
Total	96		

Test Statistics

	Color
Chi-Square(a)	102,667
df	7
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12,0.

Table C.2 Chi-square test for preferred color

Color

	Observed N	Expected N	Residual
Cool Colors	19	48,0	-29,0
Warn Colors	77	48,0	29,0
Total	96		

Test Statistics

	Color3
Chi-Square(a)	35,042
df	1
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 48,0.

Table C.3 ANOVA test results of color preferences between restaurant types

Descriptives

Color

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
B.	32	1,91	,296	,052	1,80	2,01	1	2
MU	32	1,75	,440	,078	1,59	1,91	1	2
Nik	32	1,75	,440	,078	1,59	1,91	1	2
Total	96	1,80	,401	,041	1,72	1,88	1	2

ANOVA

Color

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,521	2	,260	1,645	,198
Within Groups	14,719	93	,158		
Total	15,240	95			

Table C.4 Chi-square results of the relation between color and price

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Color * Price	94	97,9%	2	2,1%	96	100,0%

Color * Price Crosstabulation

			Price			Total
			10-30	31-60	61-100	
Color	Cool	Count	3	11	4	18
		Expected Count	8,8	7,1	2,1	18,0
		% within Color4	16,7%	61,1%	22,2%	100,0%
		% within Price	6,5%	29,7%	36,4%	19,1%
	Warm	Count	43	26	7	76
		Expected Count	37,2	29,9	8,9	76,0
		% within Color4	56,6%	34,2%	9,2%	100,0%
		% within Price	93,5%	70,3%	63,6%	80,9%
Total	Count	46	37	11	94	
	Expected Count	46,0	37,0	11,0	94,0	
	% within Color4	48,9%	39,4%	11,7%	100,0%	
	% within Price	100,0%	100,0%	100,0%	100,0%	

Table C.5 T-test results of the relation between color preference and gender

Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean
Color4 1	48	1,83	,377	,054
2	48	1,77	,425	,061

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means															
	F		Sig.		t		df		Sig. (2-tailed)		Mean Difference		Std. Error Difference		95% Confidence Interval of the Difference			
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper		
Color4	2,361		,128		,763		94		,448		,063		,082		-,100		,225	
Equal variances assumed																		
Equal variances not assumed					,763		92,673		,448		,063		,082		-,100		,225	

Table C.6 T-test results of the relation between evaluation of price and gender

Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean
Price 1	47	1,60	,614	,090
Price 2	47	1,66	,760	,111

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	
Price Equal variances assumed	3,663	,059	-,448	92	,655	-,064	,142	-,347	,219
Price Equal variances not assumed			-,448	88,097	,655	-,064	,142	-,347	,219

Table C.7 T-test results of the relation between time spending and gender

Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean
Spenttime 1	47	2,32	,695	,101
2	47	2,34	,788	,115

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means													
	F		Sig.		t		df		Sig. (2-tailed)		Mean Difference		Std. Error Difference		95% Confidence Interval of the Difference	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Spenttime	Equal variances assumed		1,031	,313	-1,139	,92	,890	,890	92	,890	-,021	,153	-,326	,283	-,326	,283
	Equal variances not assumed				-1,139	90,587	,890	,890	90,587	,890	-,021	,153	-,326	,283	-,326	,283

Table C.8 Chi-square results of the relation between color and spent time

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Color * Spent time	94	97,9%	2	2,1%	96	100,0%

Color * Spent Time Crosstabulation

			Spenttime			Total
			Less than 60'	61'-120'	More than 120'	2
Color	Cool Colors	Count	11	4	3	18
		Expected Count	11,1	5,9	1,0	18,0
		% within Color4	61,1%	22,2%	16,7%	100,0%
		% within Spenttime2	19,0%	12,9%	60,0%	19,1%
	Warm Colors	Count	47	27	2	76
		Expected Count	46,9	25,1	4,0	76,0
		% within Color4	61,8%	35,5%	2,6%	100,0%
		% within Spenttime2	81,0%	87,1%	40,0%	80,9%
Total	Count	58	31	5	94	
	Expected Count	58,0	31,0	5,0	94,0	
	% within Color4	61,7%	33,0%	5,3%	100,0%	
	% within Spenttime2	100,0%	100,0%	100,0%	100,0%	

Table C.9 Chi-square tests of selected area for applying preferred color

Selected Area for Applying Preferred Color

	Observed N	Expected N	Residual
Structural Areas	27	31,3	-4,3
Non- Structural Areas	29	31,3	-2,3
Structural &Non-Structural Areas	38	31,3	6,7
Total	94		

Test Statistics

	Selected Area
Chi-Square(a)	2,191
df	2
Asymp. Sig.	,334

a 0 cells (,0%) have expected frequencies less than 5. The minimum expected cell frequency is 31,3.

Table C.10 Chi-square results of the relation between color and selected area for applying preferred color

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Color * Area for Applying Preferred Color	94	97,9%	2	2,1%	96	100,0%

Color * Area for Applying Preferred Color Crosstabulation

			Area for Applying Preferred Color			Total
			Structural Areas	Non-Structural Areas	Structural & Non-Structural Areas	
Color	Cool	Count	5	4	9	18
		Expected Count	5,2	5,6	7,3	18,0
	Warm	Count	22	25	29	76
		Expected Count	21,8	23,4	30,7	76,0
Total		Count	27	29	38	94
		Expected Count	27,0	29,0	38,0	94,0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1,049(a)	2	,592
Likelihood Ratio	1,067	2	,586
Linear-by-Linear Association	,360	1	,549
N of Valid Cases	94		

a 0 cells (,0%) have expected count less than 5. The minimum expected count is 5,17.

Table C.11 Chi-square tests of reasons for preferred color

Reasons for Preferred Color

	Observed N	Expected N	Residual
Material	16	32,0	-16,0
Spatial Features	21	32,0	-11,0
Personal Opinion	59	32,0	27,0
Total	96		

Reasons for Preferred Color

	Reason for Preferred Color
Chi-Square(a)	34,563
df	2
Asymp. Sig.	,000

a 0 cells (,0%) have expected frequencies less than 5. The minimum expected cell frequency is 32,0.

Table C.12 Chi-square tests of type of cuisine

Cuisine

	Observed N	Expected N	Residual
Turkish	25	15,7	9,3
Western	21	15,7	5,3
Eastren	2	15,7	-13,7
Fast Food	3	15,7	-12,7
Mixed	40	15,7	24,3
Other	3	15,7	-12,7
Total	94		

Test Statistics

	Cuisine
Chi-Square(a)	77,574
df	5
Asymp. Sig.	,000

a 0 cells (,0%) have expected frequencies less than 5. The minimum expected cell frequency is 15,7.

Table C.13 Correlation test of type of cuisine and color preferences

Correlations

		Cuisine	Color
Cuisine	Pearson Correlation	1	,015
	Sig. (2-tailed)		,884
	N	94	94
Color	Pearson Correlation	,015	1
	Sig. (2-tailed)	,884	
	N	94	96

Table C.14 Chi-square test of type of activity

Activity

	Observed N	Expected N	Residual
Lunch	21	15,7	5,3
Dinner	32	15,7	16,3
Alcoholic & Non-Alcoholic Beverages	9	15,7	-6,7
Both Lunch & Dinner	9	15,7	-6,7
Mixed	21	15,7	5,3
Other	2	15,7	-13,7
Total	94		

Test Statistics

	Activity
Chi-Square(a)	38,255
df	5
Asymp. Sig.	,000

a 0 cells (,0%) have expected frequencies less than 5. The minimum expected cell frequency is 15,7.

Table C.15 Correlation test of type of activity and color preferences

Correlations

		Color	Activity
Color	Pearson Correlation	1	-,092
	Sig. (2-tailed)		,378
	N	96	94
Activity	Pearson Correlation	-,092	1
	Sig. (2-tailed)	,378	
	N	94	94

Table C.16 Chi-square test of users' age

Users' age

	Observed N	Expected N	Residual
Young	16	31,0	-15,0
Middle-aged	71	31,0	40,0
Eldely	6	31,0	-25,0
Total	93		

Test Statistics

	Users' age
Chi-Square(a)	79,032
df	2
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 31,0.

Table C.17 Chi-square test of users' status

Userstatus

	Observed N	Expected N	Residual
Employed	76	31,3	44,7
Unemployed	4	31,3	-27,3
Student	14	31,3	-17,3
Total	94		

Test Statistics

	Users' status
Chi-Square(a)	97,106
df	2
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 31,3.

Table C.18 Chi-square test of users' income

Users' income

	Observed N	Expected N	Residual
Lower Class	7	31,3	-24,3
Middle Class	75	31,3	43,7
Upper Class	12	31,3	-19,3
Total	94		

Test Statistics

	Users' income
Chi-Square(a)	91,681
df	2
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 31,3.

Table C.19 Chi-square of users' clothing

Users' clothing

	Observed N	Expected N	Residual
Casual	68	47,0	21,0
Chic	26	47,0	-21,0
Total	94		

Test Statistics

	Users' clothing
Chi-Square(a)	18,766
df	1
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 47,0.

Table C. 20 Correlation test of users' work status and color preferences

Correlations

		Color	Users' status
Color	Pearson Correlation	1	,229(*)
	Sig. (2-tailed)		,026
	N	96	94
Users' status	Pearson Correlation	,229(*)	1
	Sig. (2-tailed)	,026	
	N	94	94

* Correlation is significant at the 0.05 level (2-tailed).

Table C. 21 Correlation test of users' age and color preferences

Correlations

		Color	Users' age
Color	Pearson Correlation	1	-,049
	Sig. (2-tailed)		,644
	N	96	93
Users' age	Pearson Correlation	-,049	1
	Sig. (2-tailed)	,644	
	N	93	93

Table C. 22 Correlation test of users' income level and color preferences

Correlations

		Color	Users' income
Color	Pearson Correlation	1	-,184
	Sig. (2-tailed)		,075
	N	96	94
Users' income	Pearson Correlation	-,184	1
	Sig. (2-tailed)	,075	
	N	94	94

Table C. 23 Correlation test of users' clothing and color preferences

Correlations

		Color	Users' clothing
Color	Pearson Correlation	1	-,122
	Sig. (2-tailed)		,241
	N	96	94
Users' clothing	Pearson Correlation	-,122	1
	Sig. (2-tailed)	,241	
	N	94	94

Table C.24 Chi-square test of types of accompanying people

Accompanying

	Observed N	Expected N	Residual
Family	7	23,5	-16,5
Friends	22	23,5	-1,5
Co-workers	17	23,5	-6,5
More than one type	48	23,5	24,5
Total	94		

Test Statistics

	Accompanying
Chi-Square(a)	39,021
df	3
Asymp. Sig.	,000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 23,5.

Table C.25 Correlation test of types of accompanying people and color preferences

Correlations

		Color	Accompanying People
Color	Pearson Correlation	1	,088
	Sig. (2-tailed)		,399
	N	96	94
Accompanying People	Pearson Correlation	,088	1
	Sig. (2-tailed)	,399	
	N	94	94