SPATIAL FACTORS INFLUENCING USERS' SATISFACTION IN RESTAURANTS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
ÇANKAYA UNIVERSITY

BY

REDA R. SALEH AHMADI

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
INTERIOR ARCHITECTURE

SEPTEMBER 2018

Title of the Thesis : **Spatial Factors Influencing Users' Satisfaction in Restaurants**

Submitted by **Reda R. Saleh AHMADI**

Approval of the Graduate School of Natural and Applied Sciences, Çankaya University

Prof. Dr. CAN ÇOĞUN
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Mehmet Harun BAYIRBAYGİL
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Assist. Prof. Dr. Saadet AKBAY YENİGÜL
Supervisor

Examination Date : 10.09.2018
Examining Committee Members

Assist. Prof. Dr. Saadet AKBAY YENİGÜL (Çankaya Uni.)

Assist. Prof. Dr. İpek MEMİKOĞLU (Çankaya Uni.)

Assoc. Prof. Dr. Nur AYALP (TOBB ETU)

STATEMENT OF NON-PLAGIARISM

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name : Reda R. Saleh AHMADI

Signature :

Date : 10.09.2018

ABSTRACT

SPATIAL FACTORS INFLUENCING USERS' SATISFACTION IN RESTAURANTS

AHMADI, Reda R. Saleh
M. Sc. Interior Architecture
Supervisor: Assist. Prof. Dr. Saadet AKBAY YENİGÜL
Co-supervisor: Assist. Prof. Dr. Güler Ufuk DEMİRBAŞ
September 2018, 92 pages

Evaluation of interior environment by users is influenced by several design factors, as well as the satisfaction and the comfort, where color forms an essential part. Several studies in the literature has shown the influence of the interior design in different contexts on human behaviour and psychology. Moreover, color is considered one of the most important elements that affect space users. The concept of user satisfaction is evaluated through four main elements; product, service, price and physical environment. In this study, a questionnaire is designed to evaluate user satisfaction in four restaurants located in Ankara, Turkey. An emphasis on color effects is designed into the physical environment evaluation. With the participation of 120 restaurant users, the results of the research show that participants have evaluated the different restaurant environments in different manners. The assessments provided by the participants are statistically tested for significant difference based on gender, frequency of restaurant usage, and color properties for both User satisfaction and physical environment evaluation using one-way ANOVA testing ($p<0.05$). The results show limited influence of the demographics on user satisfaction in restaurants, while it differed based color properties.

Keywords: Restaurant interior design, color, user satisfaction, physical environment evaluation

ÖZ

RESTORANLARDA KULLANICININ MEMNUNİYETİNİ ETKİLEYEN MEKANSAL FAKTÖRLER

AHMADI, Reda R. Saleh
Yüksek Lisans İç Mimarlık
Tez Danışmanı: Dr. Öğr. Üyesi Saadet AKBAY YENİGÜL
Eş Danışman: Dr. Öğr. Üyesi Güler Ufuk DEMİRBAŞ
Eylül 2018, 92 sayfa

İç mekanın kullanıcılar tarafından değerlendirilmesi, renklerin önemli bir parçası olduğu memnuniyet ve rahatlığın yanı sıra çeşitli tasarım faktörlerinden etkilenmektedir. Literatürdeki birçok çalışma, iç tasarımın insan davranışları ve psikolojisi üzerinde farklı bağlamlarda etkisini göstermiştir. Ayrıca, renk, mekan kullanıcılarını etkileyen en önemli unsurlardan biri olarak kabul edilir. Müşteri memnuniyeti kavramı dört ana unsur ile değerlendirilmektedir; ürün, hizmet, fiyat ve fiziksel çevre. Bu çalışmada, Ankara'da bulunan dört lokantada müşteri memnuniyetini değerlendirmek için bir anket tasarlanmıştır. Fiziksel ortam değerlendirmesinde rengin etkilerine vurgu yapılmıştır. Yüzyirmi restoran kullanıcısının katılımıyla, araştırma sonuçları katılımcıların farklı restoran ortamlarını farklı şekillerde değerlendirdiklerini göstermiştir.Katılımcılar tarafından yapılan değerlendirmeler, yaş, cinsiyet, eğitim düzeyi, restoran kullanım sıklığı ve müşteri memnuniyeti için renk özellikleri ile tek yönlü ANOVA testi kullanılarak yapılmış ve fiziksel ortam değerlendirmesine göre istatistiksel olarak anlamlı bir farklılık göstermiştir ($p < 0.05$). Aynı zamanda sonuçlar, demografik özelliklerin restoranlarda kullanıcı memnuniyeti üzerinde sınırlı etkisi olduğunu göstermiştir.

Anahtar Kelimeler: Restoran iç mekan tasarımı, renk, müşteri memnuniyeti, fiziksel çevre değerlendirmesi

ACKNOWLEDGMENTS

The best moment is to harvest the fruit of patience and hard work

I attribute this work to

With all gratitude and kindness to my father, the source of strength, security and love

With all love and faithfulness to my mother, for all what she has done for me

To my wife, thank you for the patience and support

To my brothers and sisters, you are my hope and friends

Thanks to all the teachers and professors that contributed into my knowledge and learning for the past years

A special thanks to my professors Assist. Prof. Dr. Saadet AKBAY YENİGÜL and Assist. Prof. Dr. Güler Ufuk DEMİRBAŞ, who walked with me along my journey

Love to all that stood beside me and helped me

I ask goodness, grace, good health and success to all of you and I

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Subject Overview

There are several interior design elements that are proven to influence the perception, satisfaction and comfort of users. However, color is one of the most apparent characteristics of the interior design that has been researched in different contexts. The main starting point in any research about color is to understand its concept and the way it may impact the space users' experiences. There are several definitions for color; however, the simplest way to define it is by saying that it is the ability of an object to reflect a certain light wavelength (Bleicher, 2011). Therefore, the color that is visible to the human eye is the result of an object absorbing all visible light wavelengths, except for the ones that gives that object its color.

In restaurant spaces, there are several elements that affect the dining experience and user satisfaction, including the qualities of the product and the service, price, as well as the physical environment and the interior design of the space (Butt and Murtaza, 2011). The impact of the physical environment of the restaurants on their users' satisfaction is confirmed through the literature, which is part of the three main influencers of user satisfaction in restaurants, besides food, service and price (Ryu and Han, 2010).

Furthermore, there are several interior design elements that form the interior space and the theme of a restaurant, which makes its environment complex due to their variabilities. Nonetheless, there is no doubt that color, layout, and furniture design and

comfort are part of the most significant elements that influence the interior design of a restaurant (Pecotic, Bazdan, and Samardzija, 2014; Almohaimmeed, 2017). The main interest point in the research of the interior design elements of dining spaces is their relationship with influencing the users' perception and satisfaction. Thus, there are different types of restaurants' physical environment indicators that can be studied in correlation with the user satisfaction levels that are measured through several studies. However, the majority of the studies show that color is part of the most influential factors on user satisfaction (Pecotic, et al., 2014; Almohaimmeed, 2017; Tüzünkan and Albayrak, 2016). Some studies even showed a direct relation between color, the appetite levels and mood of the diners (Bhatia, 2003).

In this study, a comprehensive literature review is performed in order to understand the relationship between the interior design elements, specifically colors in restaurants, with the user satisfaction levels. A questionnaire is constructed from the four main indicators of restaurants user satisfaction; food, service, price and physical environment, with the focus on certain interior design elements that are claimed to be the most influential. Moreover, a correlational testing is performed to establish the relationship between the different design elements, in addition to the other indicators and user satisfaction.

1.2 Study Aims and Objectives

The main aim of the research is to study the impact of restaurants' interior design elements, specially color, on user satisfaction through a subjective evaluation (Questionnaire) and establish the relationship between the quality perception of the physical environment and the restaurant's user satisfaction. The study includes several interior design elements; however, the main architectural element that is considered is the color and the overall theme of the restaurants participating in the case study. Therefore, the objectives of the thesis are as follows:

1. Research the different interior design elements and understand the way they form the interior space.
2. Understand the way the human interface with the interior environment and its elements, such as; material, furniture, light and color.
3. Compile the types of interior environments according to their functions, including retail, work, residential and public environments.
4. Study the elements of restaurants' interior design and the elements that distinguish them from other types of spaces.
5. Survey the literature for the physiological and psychological impacts of color in the restaurant space.

The main objective of the study are as follows:

1. Understand the relationship between the different restaurant interior design elements and their effect on user satisfaction.
2. Perform a questionnaire on users of restaurants with different interior elements and colors in order to establish the relationship between them and the user satisfaction.
3. Test for significant differences and correlations between the demographic and restaurant usage data and the evaluations of user satisfaction and physical environment.

1.3 Thesis Structure

The structure of the thesis is divided into five main chapters, where the first chapter contains a general overview about color, restaurants' interior design elements and user satisfaction. Moreover, the introduction chapter provides the main aim of the study, along with the objectives that are addressed within the thesis, as well as a summary of the research structure and methodology. The second chapter is a result of a

comprehensive literature survey, which studies the different interior design elements and its interface with humans. Furthermore, the literature review shows the classification of the interior environments according to their functionalities and focuses on the interior design of restaurants. In order to ensure a complete coverage of the subject, the second chapter studies the physiological and psychological impacts of color in restaurants, as well as its effects on user satisfaction.

The third chapter addresses the methodology of the research, where the hypotheses of the research are constructed, and the questionnaire is designed accordingly. The chapter includes an architectural description and analysis of each of the restaurants in order to ensure a full understanding of their interior design concepts. The fourth chapter provides the results of the study, which are divided into descriptive findings, statistical analysis and discussion of the findings in line with the literature surveyed in the second chapter. The fifth chapter contains the conclusions of the research based on the results from the case study, as well as the researcher's recommendations for restaurants' interior designs.

CHAPTER 2

RESTAURANT DESIGN

2.1 Interior Design Elements

It is significant to study the spatial factors that affect the conditions of the interior spaces as it allows designers to account for the needs and perceptions of the users. Moreover, there are different classifications and viewpoints to the elements and their types that are required to be taken into consideration when designing an interior space. Some consider spatial design adequacy elements as essential; amenity, efficiency, health and safety, while other physical properties are also considered, such as; size, shape, finishes and furniture. Other spatial and physical properties are taken into consideration, including color and lighting (Lee, Alzoubi, and Kim, 2017). Additionally, the internal layout of the space is one of the most influential factors in determining the satisfaction and comfort of the users, especially in public spaces (Evans, Lepore, and Schroeder, 1996).

Livability and flexibility are also factors that determine the efficiency of the design elements incorporated in the interior space. Sufficient space has to be provided for the expected number of users that could use the space at the same time. The personal space shall be maintained even within public spaces. Flexibility is recommended in dynamic interior public spaces as it allows the owners of the space to modify the space and furniture layouts to suite the users' conditions and to maintain the comfort factor. The interior environment is mainly divided into two types of elements; physical and spatial. The physical properties are the ones concerned with the overall interior

environment elements, including the space dimensions, thermal comfort and visual comfort. The spatial environment is assessed through the elements within the environment, such as the size of the elements, their number and shape, and the aesthetical factors contained within it. Through interior design spaces, there are eight main interior design elements that are identified, as shown in Table 2.1; shape and background, continuity, sequences, repetition, rhythm, dominance, similarity, and proportion (Abdulpader, Sabah, & Abdullah, 2014).

Table 2.1: Interior Design elements and relationships (Abdulpader et al., 2014, pp. 206-209).

Interior Design Element	Description and Effect
Shape and Background	Defining the identity of the space through forming the shape legibility, which can be created through the contrast between the elements placed with the interior environment and the backgrounds around the space.
Continuity	Maintaining the same theme around the interior space creates visual comfort and acceptance, which can be achieved through adopting the same colors, shapes, patterns and textures in the interior environment.
Repetition	Flexibility is given to an interior space through repeating the components and the design patterns around it.
Sequence	Changes in continuity is recommended to be gradually introduced between the different sections of the interior environment, as a visual shock may increase the intensity of the space.
Rhythm	The elements used to form the interior space can be repeated to create a theme or a dominant rhythm that supports the visual comfort of the interior space.
Dominance	Certain elements can be highlighted within the interior environment through increasing their space or giving them visually attractive colors.
Similarity	Axes are identified within the interior space in order to create reflection or symmetrical effects, where interior design components can be placed around them creating order and legibility.
Proportion	Majorly affecting the perception of the users, the size relations between the several elements that form the interior space can form its design theme, where the size proportion between the users and the design elements is also significant.

Interior design elements have the ability to impact the perception of the space by the users. Therefore, altering few properties can make the space look more spacious or narrow. Color is considered one of the most important interior elements that affects the distribution and reflection of lighting around the interior environment (Al-Zamil, 2017). It is argued that lighter colors increase the spaciousness of the space, while dark colors decrease it. The shape of the space has also an impact on space perception, as the geometry is related to where a person sees its limits and boarders. Furthermore, the higher the ceiling and the more volume incorporated in the space, the more spacious the space seems to the users. The lines that form the different components of the interior space play a major role in determining the perception of the users towards the space. Straight lines reflect rigidity and result into a narrow-perceived space, while curved lines results into a more flexible and spacious design (Al-Zamil, 2017).

2.2 Human Interface in Interior Environments

The perception of individuals towards the design elements differs from one person to another. Therefore, a person can perceive the interior environment as comfortable, spacious or relaxing, while another person may perceive it as uncomfortable, narrow and stressing. The way that a person interacts with the environment is closely related to the cultural and social values and experiences, as well as the physical and environmental factors that surround him/ her. As shown in Figure 2.1, the age of a person decides the generation and the life experiences that are experienced over the years, while the place of living has several setting factors that affect space perception, including building complexities, furniture types and types of buildings that are encountered. Moreover, the social and cultural norms affect the personal behavior, concepts like personal space and privacy has its impact on the way a person feels in a certain environment. Thus, variety of factors can contribute into the perception of the interior environment (Mahmoud, 2017).

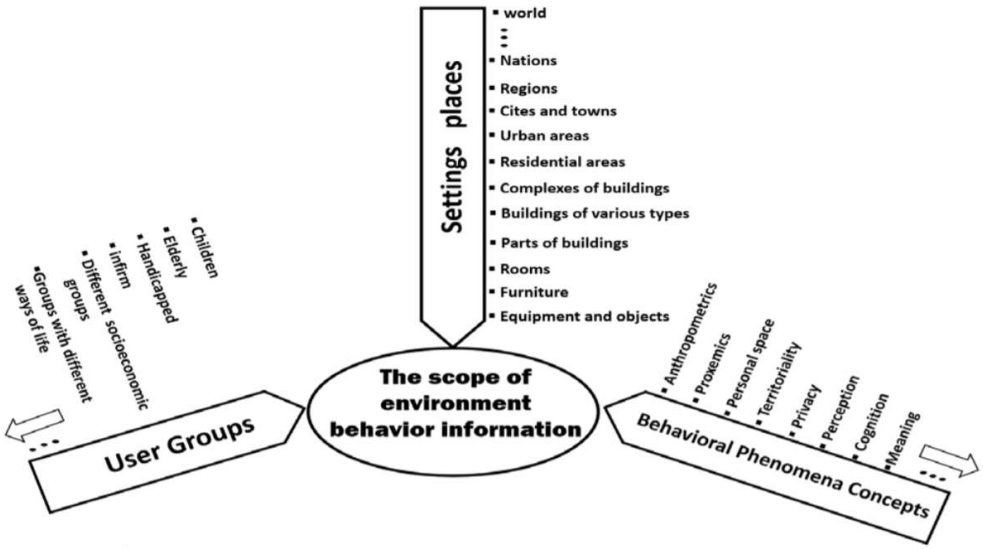


Figure 2.1: Variety of factors affecting personal perception formation (Mahmoud, 2017, p. 2)

There is no doubt that the different design elements impact the psychological status of the users. Petermans and Pohlmeyer (2014) stated that a positive interior design can increase the pleasure of the users and meaningfulness of their experience within the space. They argue that there are two types of interaction and well-being styles that are imposed by the interior environment; objective and subjective. The objective is mainly associated with static environments that are designed to satisfy the basic needs and having passive user roles. Nonetheless, the subjective well-being emerges from dynamic environments that satisfy higher order needs and the users interact with it. Moreover, the authors reviewed a positive design framework that simulates human flourishing, as shown in Figure 2.2. The framework depends on three main design goals, which are (Petermans and Pohlmeyer, 2014):

1. Designing for virtue: for morally good reasons
2. Designing for pleasure: imposing positive effects on users
3. Designing for personal significance: aligned with pursued personal goals

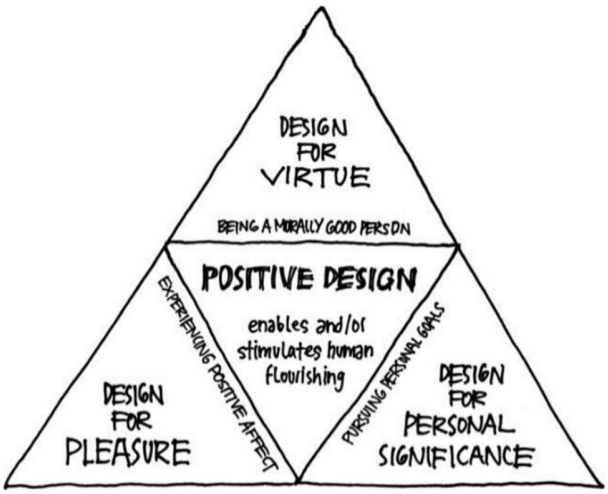


Figure 2.2: Positive design framework elements (Petermans and Pohlmeyer, 2014, p. 210)

The aesthetics of the different design elements has also been proven to impact the individual perception towards them. In any environment, materials that have smooth surfaces reflect cleanness and tidiness, while rougher surfaces reflect rigidity and durability (Felming, 2014). Moreover, a study has shown that the availability of furnishing in a space, as well as the increase in furniture scale, decrease the spaciousness perception of the interior environment. Furnitures with higher surface areas alter the perception of spatial dimensions, including height and width (Von Castell, Oberfeld, and Hecht, 2014). The impacts of color, as a specific topic is reviewed in the fifth section of this chapter. Generally, color is evaluated based on three main properties; brightness, purity and reflection (O'Connor, 2015).

2.3 Types of Interior Environments

There are different classifications for an interior space depending on its functionality, which subsequently impacts the interior design elements within it. A simple classification into residential and commercial spaces can be found in interior design principles' books, where the residential environment is identified by the space

designed for permanent human lodging, while the commercial environments vary from spaces that are used temporarily by users for commercial purposes (Gibbs, 2005). Other sources refer the term commercial environments to office environments, while referring to other spaces with trading and dining activities as retail environments (Piotrowski and Rogers, 2007).

Furthermore, the urban interior spaces are classified into several types according to the functionality of the environment, as follows (Karacor, 2016), and examples are provided in Figures 2.3 to 2.5:

1. Internalized public space: refers to formal public spaces with external and internal environments and private areas in some parts. An example of this type is a shopping mall.
2. Third place spaces: refers to places where semi-public and social gatherings are conducted with variety in publicness and privacy, such as cafes, restaurants, libraries and mosques.
3. Retail space: refers to privately owned spaces with public access, where commercial activities are exchanged, such as shops, indoor markets and petrol stations.
4. Internal private space: refers to business spaces and private ones, such as houses and offices.

Figure 2.3: Shopping mall as an example of internalized public spaces where public and private spaces are available (Radub, 2015) – the mall example shows the least degree of privacy.

Figure 2.4: Semi-private setting as an example of third place spaces (Park Regis, 2015) – A restaurant interior can have moderate degree of privacy depending on the level of service provided. Many restaurants can have rooms with shading, separation or they are built as an independent room.

Figure 2.5: Private business interior space (RSC, 2016) – A bedroom can be an example of a more private space.

2.4 Interior Design of Restaurants

The main criteria that determine the interior design of the restaurants is the type of the restaurant, which vary from casual dining, family, sine dining to fast food restaurants. There are special design elements that are considered for restaurant design. Lighting need to be provided for general and specific tasks, such as walkways and tables, respectively. The colors in the restaurant interior need to be linked and coordinated as they play an essential role in temperature feeling and appetite simulation (Malekshahi, 2013). Furthermore, the acoustic environment needs to allow people to socialize while dining, where 40 dB is specified as the maximum noise limit (Malekshahi, 2013)). Also, ventilation is one of the most important criteria in restaurants, as food is cooked in closed areas and cooking smell can be annoying to

diners. For finishes, the flooring of the restaurants is mainly made from non-slippery material and vary from wood coverings to ceramic tiling. The walls can be painted or covered with wood panels, wallpaper or curtains depending on the restaurant class and type. Therefore, there are several considerations to be accounted for when selecting the general and specific design for restaurants (Malekshahi, 2013).

The quality of a restaurant is mainly dependent on three main elements; environment, employees and interaction with the user. The environmental factors include the location of the restaurant, its design, music and lighting. The location of the restaurant is essential, where it is defined by the potential users around it, accessibility, parking, visibility and closeness to competitors. Moreover, there are five criteria that determine the interior design of the restaurant; aesthetics, ambience, lighting, layout and table setting (Robenson and Kleynhans, 2015).

In a study on 303 subjects, the different criteria of restaurant design were evaluated in order to understand the most important ones. Closeness to customer was voted as the most important criteria, followed by accessibility and parking availability. Moreover, the restaurant aesthetics and ambiance were equally chosen as the most important interior design criteria, which indicates the significance of these criteria in attracting customers (Robenson and Kleynhans, 2015). Studies also showed that comfort of seating and convenience are the factors influencing place attachment and customer retention (Alansari, 2016). The restaurants are mainly designed according to a certain theme that is dominant in the interior environment. The designs may vary from traditional/ classical designs, as shown in Figure 2.6, to contemporary designs, Figure 2.7, and modern designs, Figure 2.8.

Figure 2.6: Restaurant classical design at Carlyle, Manhattan New York (New York by Design, 2015) – A design that simulates an antique theme or its environment is old fashioned can be considered as a classical or traditional restaurant.

Figure 2.7: Contemporary restaurant design with Asian style (Picrevise, 2014) – Restaurant environments that contain elements of that their designs were originated from the 1950s until the late 1990s, where soft edged elements were mainly used.

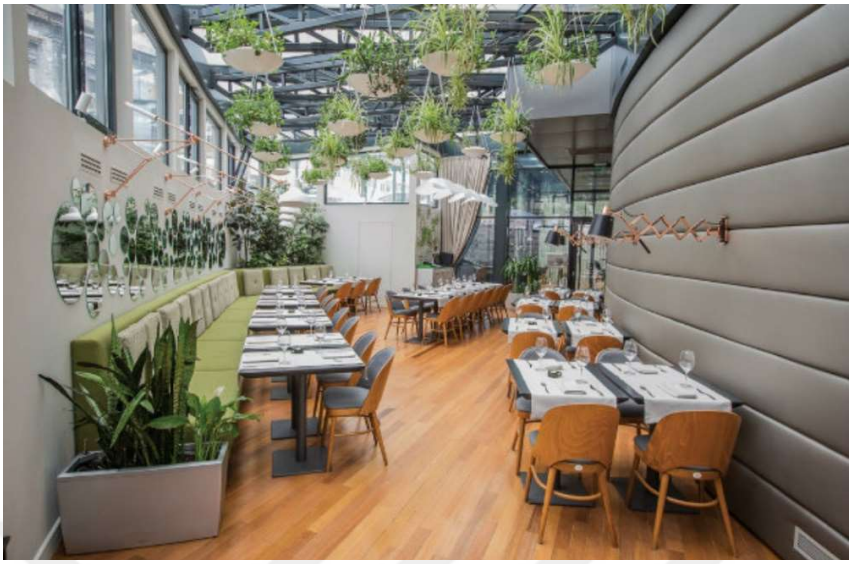


Figure 2.8: Modern restaurant design in Bucharest (Zlregata, 2018) – The current designs feature a use of natural colors and natural elements to produce a space that is environmentally-friendly. Minimalism is the design philosophy as clean edges are used.

2.5 Physiological and Psychological Effects of Color in Restaurants

Different design elements have proven impacts on the physiological and psychological status of the space users. Design has the ability to form the individual's identity, sense of privacy and behavior. Moreover, there are proven results that design has an impact on the user's relaxation, emotional complexity and boredom (Colombo, Laddaga, and Antonietti, 2015). Furthermore, lighting in the interior space has a direct impact on the way objects are perceived in terms of their size, texture, position, shape and color (Manav, 2013).

2.5.1 Physiological Effects

The majority of the studies on color effects focused on the psychological influences that are related to behaviour and emotions. Nonetheless, some of the studies have researched the impact of color on the physiological performance; body and mind. Simulating fighting combat situations, a study used twenty-eight sportsmen to test the impact of wearing a red or blue jersy on their physical performance. The study measured six main attributes: power, heart rate before combat, heart rate during combat, heart rate after combat, points and RPE (Rating of Percieved Exertion). The statistical analysis show no significant difference in any of the attributes based on the jersy color. However, the authors note that players with red jersies recorded a higher heart rate during and after the combat. Moreover, players with red jersies had more power in comparison with the blue and no jersy conditions (Dreiskaemper, Strauss, Hagemann, and Busch, 2013).

Focusing on physical performance during sports activities, a similar study deployed thirteen runners with colorless and colored goggles (red and blue) and measured their performance. The study measured the runners' power during the different goggle conditions. The research found no significant differences between the two conditions, where slight advantage for blue was found in the first group and a slight advantage for red was found in the second group during the power per kilogram measurement (Fujii, Nakano, Wakita, and Maeshima, 2017).

Another type of studies focused on the physiological performance of the brain through measuring memory performance. A Malaysian research reviewed studies that correlated color to memory and attention performance. The study states that the more attention stimulated by a certain color, the higher is the chance to create a more permanent memory. Some studies found that persentations with colors grab more attention than colorless presentations. It was also found that warm colors, such as orange, red and yellow are able to grab more attention than cool colors. The review shows results from studies that proved that color can create memory faster than object

shapes; hence, grabbing more attention. Such a result was confirmed by several studies, which were presented in the review. Participants in experiments were able to recognize colored pictures 5% higher than black and white pictures. This percentage reached up to 10% in other studies that showed participants colored and non-colored pictures and asked them to describe them and recognize them based on their memory (Dzulkifli and Mustafar, 2013).

2.5.2 Psychological Effects

Color has been proven to be one of the most influential factors in interior design on human cognitive, affective and behavioral aspects. However, several factors affect the way an individual perceive a color or any of its shades. Individual differences such as gender and age, as well as the cultural background are all personal factors that has influence. The context of the color within a certain environment also changes its perception for the users (O'Connor, 2015).

Furthermore, lighting in the interior space has a direct impact on the way objects are perceived in terms of their size, texture, position, shape and color. The different properties reflected from a colored object or plain influence comfort, relaxation and spaciousness perception. A study on different lighting properties reflected on colored objects showed that lighting with higher illuminance on colored objects simulated better visual comfort and spaciousness, while lower illuminance simulated more relaxation. Such results can be taken as a proof of the impact of lighting on color and the impact of color on space perception and psychological status of the space users (Manav, 2013).

A study that experimented three types of colored light (red, green and white) on ninety-seven participant and their perception towards an interior space showed no significant difference between the participants based on the pleasantness factor. Nonetheless, participants' answers to the prepared questionnaire showed that the interior space looked more aesthetically attractive under the red and green colors in comparison with the white color, while the white color was indicated to create a more functional

interior space in comparison with the red and green colors. Participants found the interior space less comfortable under the red color condition than the green and white colors, while the more spacious effect was found higher under the white color (Odabasioglu, 2009).

In a review of the literature studies that covered the impact of color on human behavior between 1964 and 2011, forty studies were performed in simulation environments (laboratories) or office/ workplace environments (Jalil, Yunus, and Said, 2012). Only one study was performed in a restaurant environment, which assessed the environment using a non-performance method. This shows lack of available data to compare results within the literature in restaurant contexts. However, other studies were conducted in other environments and using an actual or made up contexts to simulate the actual conditions of the desired environments. The assessment methods varied between six main types; environmental assessment, psychological, physiological, performance, non-performance and observational assessment. The results of these studies can also be used in order to understand the psychological and physiological impacts of color, although there are very few studies that addressed these effects in the restaurant context (Jalil et al., 2012).

Other researchers studied the effects of color on the psychological behavior of humans in different contexts. In educational contexts, purple and blue colors were found to simulate a better attention in the classroom, in comparison with other colors, such as red, yellow and green, where the comparison was measured through am academic performance test (Duyan and Unver, 2016). In counseling rooms, dark colors were found simulating more pleasant, interesting, exciting, relaxing effects; however, the sense of safety was increased by the use of other colors, including red, purple, blue and pink (Liu, Ji, Chen, and ye, 2014). Results of such studies confirm the psychological effects of color depending on the context of the interior space. Therefore, similar results

can be found within restaurant regardless of the few studies that were performed within this context.

2.5.3 Personal Preferences

Another study used a simulation of a restaurant environment in order to evaluate three main criteria; color, lighting and décor. Two color conditions were experimented; monochromic and complementary. Two lighting conditions were experimented; bright and dim. Two décor conditions were experimented; elaborate and plain. The six different conditions were mixed and matched to produce eight different interior space environmental conditions. Three factors were tested; sociability, emotion and behavior, which was evaluated with 162 participants. The results of the statistical analysis using a one-way ANOVA test did not show any significant difference between the eight interior environment conditions in the case of dining with friends. However, in case of dining with a special friend, monochromatic colors, dim lighting and plain décor was the most significantly different case in comparison with the other cases. This case also showed similar results in emotions and behavior. The described condition yielded more positive perceptions showing higher efficiency in comparison with other results (Wardono, Hibino, and Koyama, 2012).

In a restaurant context, a research experimented the effect of color on user assessment, evaluation of restaurant quality, user choice based on color and evaluation of restaurant's atmosphere. A questionnaire was designed to study the four research points with ninety-six participants, in three restaurants in Ankara. The results show that the majority of the participants preferred the restaurant atmosphere with the brown color, followed by the red color. Moreover, the warm colors were preferred by around 80% of the participants over cool colors. Nonetheless, no significant differences were found in color preference according to restaurant type or time spent in the restaurant.

Furthermore, significant differences were found in color preference based on price range and gender (Söker, 2009).

2.6 Impact of Restaurant Design on User Satisfaction

Several results have investigated the relationship between restaurant design elements, including its finishing, furnishing and layout, and different factors that determine user satisfaction in food and beverage industry. An Indonesian study researched the relationship between the ambiance and quality of service in relation with user satisfaction with hundred participants in a single restaurant. Three main variables were considered; ambiance, service quality and user satisfaction. Three sub-indicators were used for ambiance; cleanliness, concept and interior design. No further details or indicators were considered in that aspect. Service quality has been evaluated through three sub-indicators; delivery on time, employees service and facilities, while user satisfaction has been measured through three sub-indicators; price, product quality and place coziness. The results of the study show that both ambiance and service quality have an impact on user satisfaction (Senduk, Saerang, and Lambey, 2016).

Furthermore, a Croatian study involving one hundred and six participants in several restaurants studied the difference in the impact of interior design of restaurants on user satisfaction between city residents and tourists. The study adopted eighteen indicators for restaurant's interior design, including size, color, layout, furniture, lighting, artwork, wall design, music, communication and tableware. The results of the study showed that participants preferred medium sized restaurants and medium spacing between tables. No specific color was found as preferred in a restaurant; however, the participants indicated that a combination of colors is more preferred than a single color. Furniture comfort was reported as the most important interior design element, followed by music and tableware condition. The city residents have shown a higher satisfaction level than tourists in the majority of the factors (Pecotic et al., 2014).

Another study investigated the relationship of four elements of restaurant interior with user satisfaction; spatial layout, interior design, color and music. A total of four hundred and eleven respondents participated in the study through a questionnaire methodology. The questionnaire collected demographic data, as well as restaurant usage data through indicating the frequency of visiting restaurants per month. The second part of the questionnaire proceeded into evaluating the four main elements that are targeted in the research. The highest correlation was found between color and user satisfaction, which yielded a strong correlation of 0.731 at the 0.01 level. Correlations were also sound between user satisfaction and spatial layout (0.711), interior design (0.684) and music (0.620) at the 0.01 level (Omar, Ariffin, and Ahmad, 2015).

Moreover, the majority of the studies on the subject identified four main elements that determine user satisfaction in restaurants; product quality, service quality, physical environment and price, as shown in Figure 2.9. Product quality includes food taste and presentation, while the perceived price measures the way users evaluate the value for money provided by the restaurant. The physical environment is also evaluated through several indicators depending on the depth of the study towards a certain indicator (Ryu and Han, 2010; Butt and Murtaza, 2011).

Figure 2.9: Elements of user satisfaction in restaurants (Ryu and Han, 2010)

Through a correlational study between the four different elements of restaurant user satisfaction, it was found that the physical design of the restaurant interior environment has a medium correlation with service quality (0.533), product quality (0.409) and user satisfaction (0.341) at $p<0.01$. The study involved indicators for the different elements with the participation of a hundred respondents (Sabir, Irfan, Akhtar, Pervez, & Rehman, 2014). Studies have also showed different interior design elements as the most influential over user satisfaction in restaurants. A study has shown that color, layout, furniture design and furniture comfort are the most influential elements over user satisfaction (Almohaimmeed, 2017). Another study has also shown color attractiveness as the most influential factor; however, other elements were considered, such as painting and pictures, scent, table settings and lighting (Tüzünkan and Albayrak, 2016). Tüznkan and Albayrak (2016) have found several elements that influences the satisfaction towards the restaurant's physical environment as shown in Figure 2.10.

Figure 2.10: Factors determining physical environment in restaurants (Tüzünkan and Albayrak, 2016, p. 5)

Tuzunkan and Albayrak (2016) have also tested their data for variances based on demographics and restaurants' usage frequency. Significant differences, at $p<0.05$ level, were found according to dining frequency for the aesthetic, service staff looks and ambiance indicators. Moreover, significant differences were also found according to education level for the layout and service staff looks, while significant differences were found according to lighting for age categories. Another study has confirmed that the appetite level for the restaurants' users differs by the interior color of the physical environment. As shown in Figure 2.11, colors between red, orange and yellow simulate the highest level of appetite, while colors like yellow-green, green and purple simulate the lowest levels of appetite (Bhatia, 2003). Tantanatewin and Inkarojrit (2018) performed a study that showed that the interior color of a restaurant has a relationship with the user's decision to enter the restaurant or not.

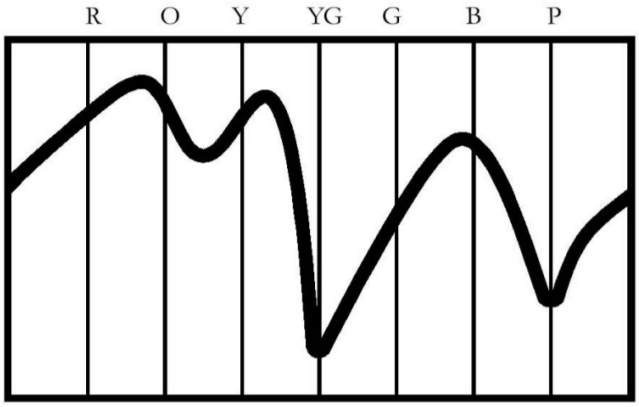


Figure 2.11: Levels of appetite according to restaurant's interior environment color (Bhatia, 2003, p. 22)

2.7 Color and its Properties

There are several attributes that are used to describe a color, while the hue is the direct description of a color in terms of its type; red, blue, yellow, etc. Saturation describes the color based on the level of hue strength versus weakness towards gray (O'Connor, 2015). Experiments have shown that the surrounding colors affect the way people describe their brightness. Environments with darker surrounding colors showed lower brightness than those surrounded with lighter colors. The reflection degree of the color was also found to be affected by its saturation, as shown in Figure 2.12. In other words, the more saturated is the color the higher reflectivity it has. It can be also stated that color properties are correlated to each other, where brightness can increase reflection, and vice versa (Corney, Haynes, Rees, and Lotto, 2009).

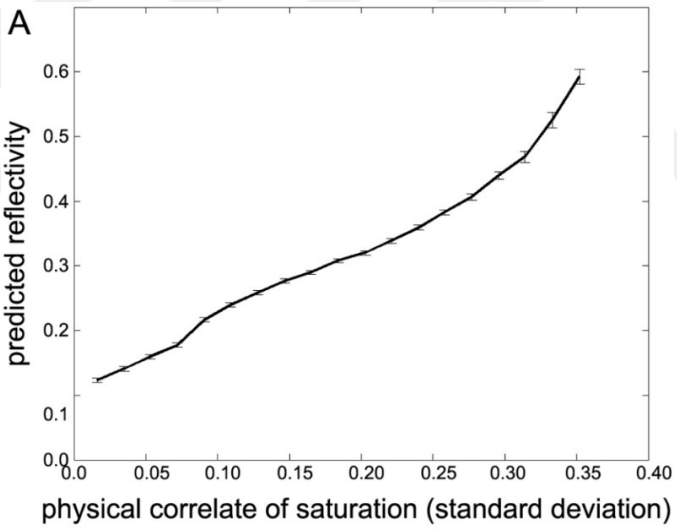


Figure 2.12: Impact of color saturation on reflection (Corney, et al., 2009, p. 4)

There are several color properties to be considered when studying an interior space. Some studies considered hue, saturation and brightness to measure attention and

preferences of space users (Camgoz, 2000). Another study considered luminance, wavelength and purity during a research that aimed to correlate the color and lighting properties (Pridemore, 2007). An early study considered three properies of color during color description by participants; hue, saturation and lightness (Judd, 1940). Purity and brightness are also used to describe colors in scientific deciplines in material description and reactivity (Chang, Liang, Yan, and Chang, 2010). Therefore, in the current study four main color properties are considered; hue, reflection, brightness and purity. The subjects in the case study are asked to describe the environments based on the color type; hue, as well as give their evaluation of the three remaining properties based on their estimation on a Likert scale.

CHAPTER 3

METHODOLOGY

In this chapter, the case study conducted in this research is previewed, starting from structuring the hypotheses of the research. Moreover, the restaurants that are involved in the study are presented and described. The main methodology in this study is a questionnaire methodology. Therefore, the procedures, questionnaire design and participants responding to the questionnaire are described. Finally, the sampling and analysis procedures are reviewed.

The methodology of the research depends on a thorough understanding of the interior design themes, colors, and interior design elements of the case study restaurant in order to facilitate their relationship with user satisfaction. The study adopts a questionnaire method as part of a subjective evaluation by the restaurants' users. The main elements that are proven through the literature in measuring user satisfaction are used in designing the questionnaire, while the analysis depends on findings that are combined from the architectural analysis and the questionnaire results. Such methodology allows the researcher to measure user satisfaction with emphasis on the physical environment of the space.

3.1 Research Question and Hypotheses

The study includes several factors, which are studied for their relationships and differences; user satisfaction, physical environment and restaurant environment. Therefore, the research question that are mainly answered in this study are;

1. What are the elements that affect user satisfaction, including physical environment indicators, within restaurant environments?
2. How do physical environment indicators influence user satisfaction?

The research studies the way certain indicators may impact user satisfaction and satisfaction from the physical environment based on indicators that are supported by the literature (Ghimire, 2012; Tüzünkan and Albayrak, 2016). Based on the objectives of the research and the questionnaire designed and presented (see Appendix A), the following hypotheses are structured as follows:

H1: There is a significant difference between males and females based on restaurant user satisfaction indicators and overall satisfaction levels.

H2: There is a significant difference between males and females based on restaurant physical environment evaluation indicators.

H3: There is a significant difference based on restaurant usage frequency in user satisfaction indicators and overall satisfaction levels.

H4: There is a significant difference based on restaurant usage frequency in physical environment evaluation indicators.

H5: There is a significant difference based on interior environment color description in user satisfaction indicators and overall satisfaction levels.

H6: There is a significant difference based on interior environment color description in physical environment evaluation indicators.

3.2 Description of the Site

Four restaurants have been selected for the study, which are Acar Pide and Kebap, Ciğerci Yakup, Hoşdere Kebap and Şampiyon Dönercisi. The restaurants are selected based on their regular usage by the users and the difference of the interior environments between each other. All of the restaurants are located in Ankara, Turkey. The cuisine selected for all of the restaurants are similar, Turkish cuisine; Döner, Kebap, etc., in order to draw the main attention of the study towards the physical environment. Nonetheless, the other user satisfaction elements are also considered as part of the study. The first restaurant is Acar Pide and Kebap, which is located in Dikmen, Ankara (Figure 3.1). The restaurant has a simple interior design and layout, plan in Appendix B, where the red and white colors are the most dominant, as shown in Figure 3.2.

Figure 3.1: Entrance of Acar Pide & Kebap (photograph taken by the author)

The entrance of Acar Pide and Kebap can reveal the dominant colors in the restaurant's interior environment; red and white.

Figure 3.2: Interior of Acar Pide and Kebap (photograph taken by the author)
The interior environment of Acar Pide and Kebap uses two main colors red and white.

The second restaurant is Ciğerci Yakup located in Dikmen, Ankara. The restaurant has a classic furniture design with modern interior, here the dominant colors are white, black and brown, as shown in Figures 3.3 and 3.4. The plan of the restaurant is available in Appendix B.

Figure 3.3: Store front of Ciğerci Yakup (photograph taken by the author)

The store front of Ciğerci Yakup allows the users to see the interior environment of the restaurant, while it uses several colors in the front; white, red and blue.

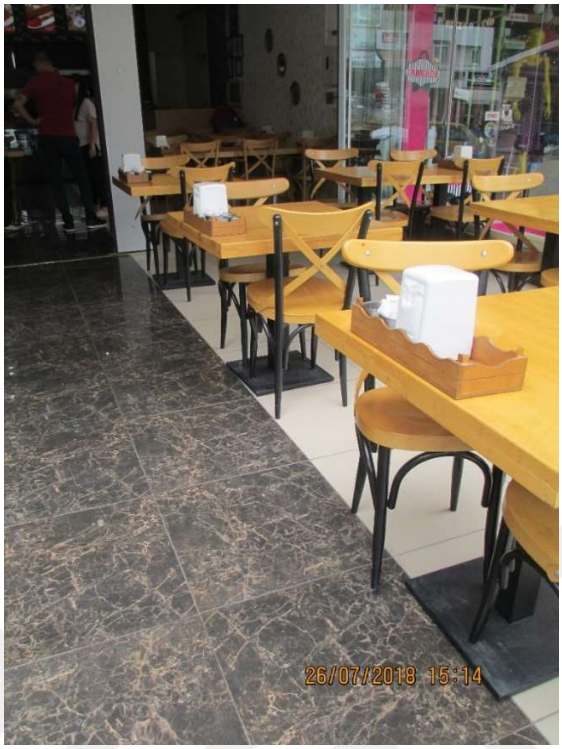


Figure 3.4: Interior of Ciğerci Yakup (photograph taken by the author)

The interior environment of Ciğerci Yakup has several colors; yellow and black for chairs and tables and brown and white for the flooring.

The third restaurant is Hoşdere Kebap, which is located in Ayrancı, Ankara. The restaurant has a contemporary design with dominant colors as brown and white, as shown in Figures 3.5 and 3.6. The plan of the restaurant is available in Appendix B.

Figure 3.5: Storefront of Hoşdere Kebap (photograph taken by the author)

The store front of Hoşdere Kebap uses multiple colors from red and green on the signage to white and brown for the front structure.

Figure 3.6: Interior design of Hoşdere Kebap (photograph taken by the author)

The interior of Hoşdere Kebap uses brown and white for tables and chairs, while these colors are dominant in most of the interior elements. A hint of green is added with plantation.

The fourth restaurant is Şampiyon Dönercisi, which is located in Keçiören, Ankara. The dominant colors of the interior are red, black and brown, as shown in Figures 3.7 and 3.8. The plan of the restaurant is available in Appendix B.

Figure 3.7: Serving counter of Şampiyon Dönercisi (photograph taken by the author)

Figure 3.8: Interior of Şampiyon Dönercisi (photograph taken by the author)

The interior of Şampiyon Dönercisi has the most varity amongst the case study restaurant. Several colors are noticed from red, yellow, gray, briwn, black and white.

3.3 Procedure and Questionnaire

The main methodology adopted in this research is a questionnaire methodology, which resulted in forming the questionnaire form attached in Appendix A. The scale adopted in evaluating the physical environment and user satisfaction is based on scales provided by several studies; however, the scale is closer to the ones provided by Tüzünkan and Albayrak, 2016 and Ghimire, 2012. Questionnaires were taken throughout the opening times of the restaurants. Participants spent 10 to 15 minutes to fill the questionnaires. The questionnaire is mainly divided into five main sections, which are:

- Demographics and restaurant usage: data collected are gender and the frequency of visit to the specific restaurant and restaurants in general.
- Colour description: the participants are requested to describe the color of the restaurant based on dominant color. Eleven colors were provided for multiple selection based on the main color hues that are found in interior environments. Moreover, the participants are requested to describe the colours of the restaurant based on color properties; brightness, purity and reflection, on a 7-point Likert scale from low to high.
- User satisfaction evaluation: the quality of ten indicators are assessed on a 7-point Likert scale from low quality to high quality. The indicators are: food taste, portion size, food presentation, utensils cleanness, food freshness, restaurant food variety, employees' neatness, employees' communication, service and price suitability with provided quality.
- Physical environment evaluation: the quality of twenty indicators are assessed on a 7-point Likert scale from low quality to high quality. The indicators are: aesthetics and facility, furniture cleanness, color attractiveness, color suitability for restaurant theme, furniture quality, painting and pictures, wall decoration attractiveness, restaurant layout, space spaciousness, privacy level, size and shape of layout, comfort of movement, ambience, temperature comfort, scent

pleasantness, background music, noise level, table arrangement, table covers and lighting.

- Overall satisfaction: two main aspects of user satisfaction are requested to be evaluated on a 7-point Likert scale from strongly unsatisfied to strongly satisfied. The first aspect is the product, service and price, while the second aspect is the physical environment.

The procedure started by introducing the participants to the study briefly for a minute, handing them the questionnaires, and reviewing the sections with them in order to ensure they understand all the questions. Uncertainities were addressed as asked by the participants.

3.4 Participants

The participants are randomly selected from the users of the restaurants; focusing on adults who are above 18 and ensuring that both genders are equally presented in the sample. Nonetheless, a special care has been taken in order to collect closely equal samples of males and females in each restaurant. The same measure has been taken in order to ensure the variety of age categories participating in the questionnaire. These measures mainly are taken to be able to test the hypotheses for significant differences and correlations.

3.5 Sample and Analysis

The target sample for the research is 120 participants distributed evenly on the four restaurants. The data is collected during July and August 2018. All data are entered in IBM SPSS Statistics (version 24) for further analysis. The first analysis performed is the reliability analysis in order to ensure a minimum of 0.7 Cronbach's Alpha acceptable for social sciences research (Taber, 2017). Reliability is tested for the whole

questionnaire parts and separately for each part. Furthemore, descriptive statistics are provided in the next chapter, as well as statistical analysis through using One-way ANOVA, t-test and Spearman's rho correlational factors. Based on the results of the statistical testing, the hypotheses are tested, and the results are provided in the conclusions of the study. After conducting the study 120 questionnaires were received back from the four restaurants. A reliability analysis is performed to ensure the survey design and sample size sufficiency, where Cronbach's alpha was calculated as 0.903. Cronbach's alpha was found as 0.826 for the user satisfaction scale and 0.909 for the physical environment evaluation scale. As all indices are above 0.7, the questionnaire and the results are considered reliable.

CHAPTER 4

RESULTS

4.1 Demographics and Restaurant Use

A total 120 participants have filled the questionnaire in the four restaurants included in the case study. As shown in Figure 4.1, 50% are male and 50% are female, corresponding to 60 males and 60 females. The even distribution of the sample ensures that the analysis based on gender differences and correlations take into consideration an equivalent dependent variable.

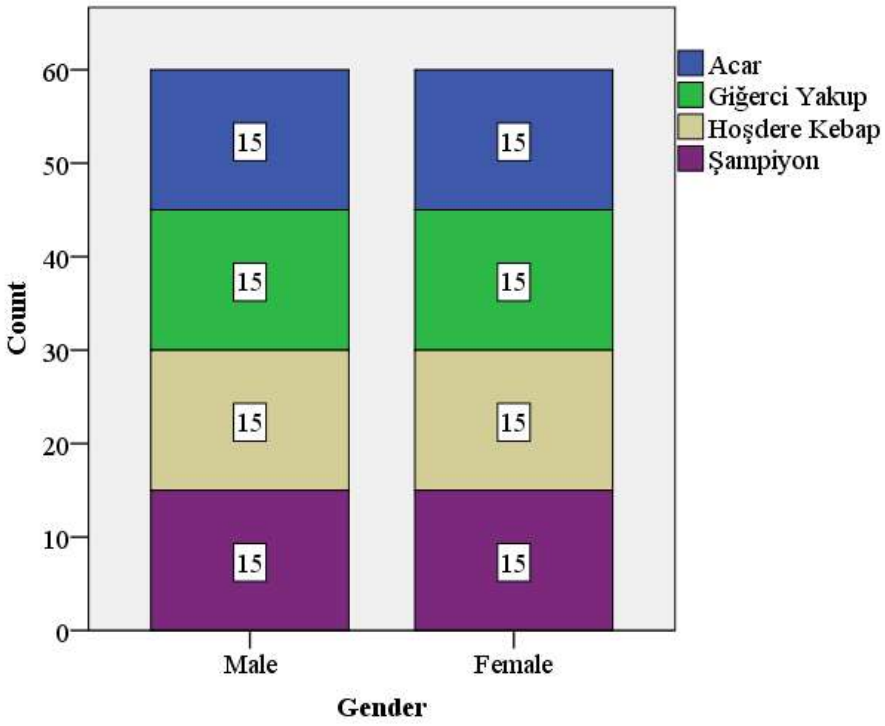


Figure 4.1: Gender of participants

The participants were also requested to indicate their age category, as shown in Figure 4.2. The majority of the participants lay between the ages of 24 and 40. A normal distribution of the sample within the age categories allows for a reliable statistical analysis based on the age factor. Moreover, a normal distribution is found within the education level results. When asked about the frequency of restaurants' visits that the participants perform, 21.67% indicated that they visit restaurants on a daily basis, 30.83% a few times a week and 34.17% a few times a month, as shown in Figure 4.3.

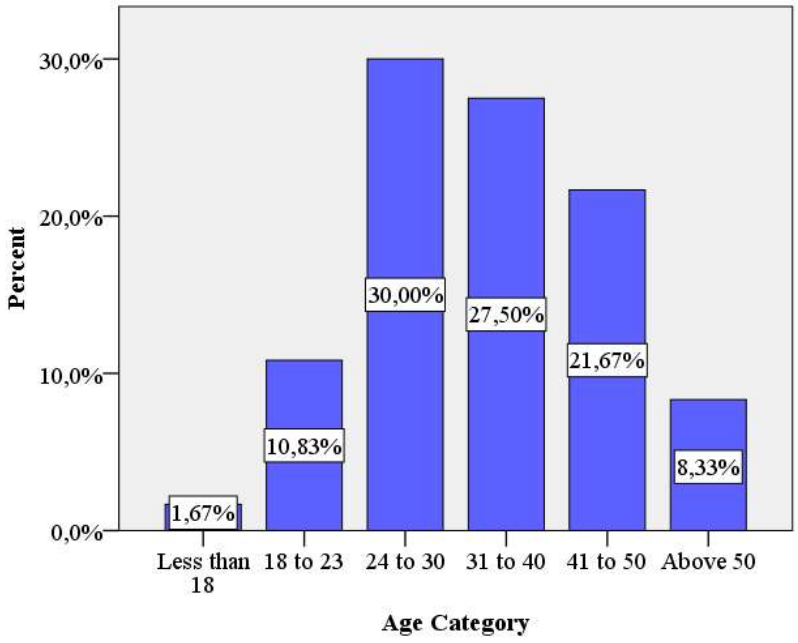


Figure 4.2: Age categories of questionnaire participants

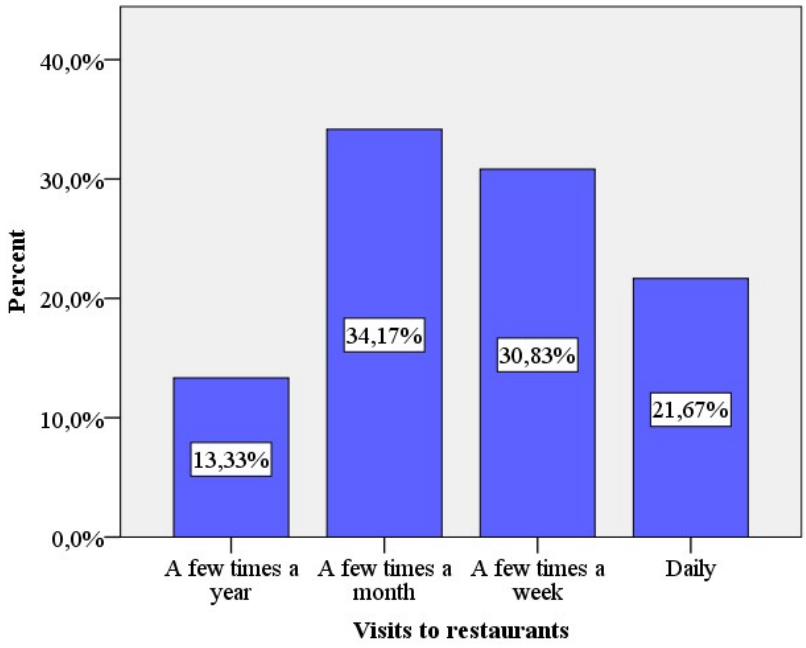


Figure 4.3: Participants' frequency of visits to the restaurants

4.2 Restaurants' Evaluations

Four restaurants have been chosen for the case study; Acar Pide and Kebap, Ciğerci Yakup, Hoşdere Kebap and Şampiyon Dönercisi, The restaurants have been selected from different areas of Ankara and different designs; however, all restaurants serve Turkish cuisines. The type of the food has been set as a constant in order to ensure that the evaluation is based on the quality of the restaurant rather than the food type. Moreover, the selected restaurants contain several colors in each one of them, which form color themes instead of a single-color environment.

4.2.1 Acar Pide and Kebap

The participating sample from this restaurant form 25% of the total sample, where the majority of the participants indicated that they visit it a few times a month (50%), as shown in Figure 4.4.

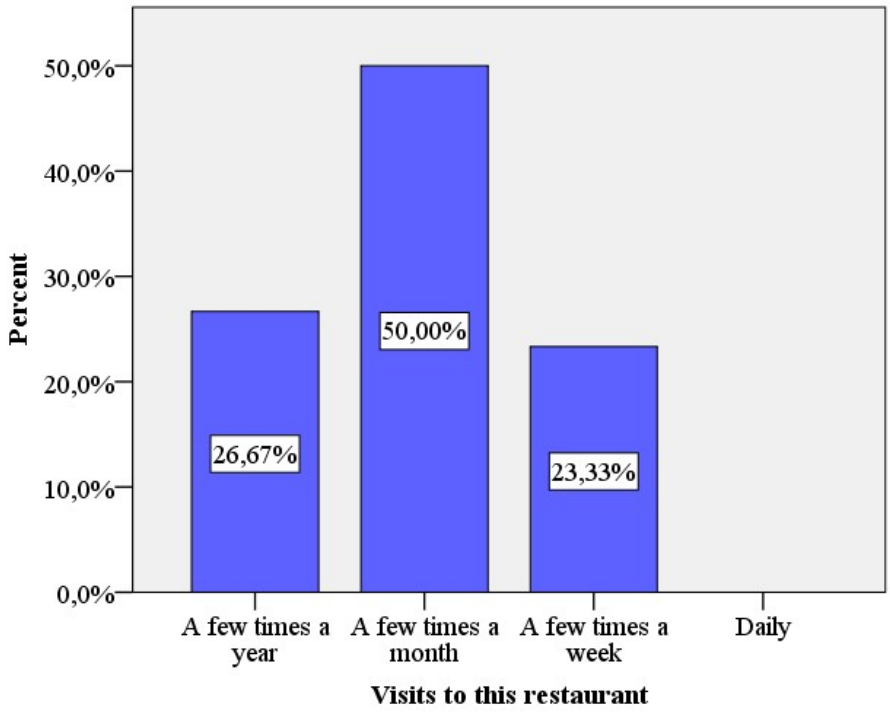


Figure 4.4: Frequency of visit to Acar Pide and Kebap

Out of the questionnaire's color selection, three colors were chosen; white, red and brown. With more than a color choice possible, Table 4.1, the red color was chosen 100% of the time, while the white color was chosen 36.7% of the time, followed by brown with 23.3% of the time. The red and white color are clearly visible equally in the restaurant's furniture; however, that balance is strongly tipped towards the red color with the use of a red hue at the floor covering. The properties of the color theme have been evaluated, Table 4.2, where reflection and purity has been estimated at 63.86% and 72.86%, respectively. Such a result confirms the darkness of the color theme, which is affected by the lighting and the properties of the colors selected for the interior design elements.

Table 4.1: Color descriptions of Acar Pide and Kebap based on hue

		Responses		Percent of Cases
		N	Percent	
Color	White	11	22.9%	36.7%
	Red	30	62.5%	100.0%
	Brown	7	14.6%	23.3%
Total		48	100.0%	160.0%

Table 4.2: Color description of Acar Pide and Kebap based on color property

Color Property	Mean Score	Standard Deviation	Percent*
Brightness	5.77	0.568	82.43%
Purity	5.10	1.155	72.86%
Reflection	4.47	1.592	63.86%

*. Percent is calculated by dividing the mean score of the color property by 7 based on 7-point judgement scale.

Table 4.3 shows the user satisfaction evaluation performed by the participants at Acar Pide and Kebap. All of the ten aspects were evaluated with a minimum mean score of 5.30 reflecting at moderate user satisfaction level. Furthermore, the physical environment indicators had a minimum 4.70 for the size and the shape of the layout, as shown in Table 4.4. Privacy level and paintings and pictures has been the second and third lowest, respectively.

Nonetheless, utensils cleanness and food variety were the highest user satisfaction indicators, while color suitability and table arrangement were the highest physical environment indicators. The overall satisfaction evaluation shows users are more satisfied from the product, prices and services than the physical environment of the restaurant, indicating the requirement for changes in the interiors, as shown in Table 4.5.

Table 4.3: User satisfaction evaluation of Acar Pide and Kebap

User Satisfaction Indicator	Mean Score	Standard Deviation
Food taste	5.30	0.651
Portion size	5.60	0.814
Food presentation	5.43	1.073
Utensils cleanness	5.83	0.986
Food freshness	5.50	0.900
Restaurant food variety	5.73	1.112
Employees' neatness	5.50	0.974
Employees' communication	5.57	0.971
Service	5.57	1.006
Price Suitability with provided quality	5.47	1.042

Table 4.4: Physical Environment evaluation of Acar Pide and Kebap

Physical Environment Indicator	Mean Score	Standard Deviation
Aesthetics of the facility	5.10	0.960
Furniture cleanness	5.43	0.971
Colour attractiveness	5.47	1.074
Colour suitability for restaurant theme	5.53	1.008
Furniture quality	5.43	0.971
Painting and picture	5.03	1.159
Wall decorations attractiveness	5.13	1.167
Restaurant Layout	5.17	1.053
Space spaciousness	5.37	0.765
Privacy level	5.00	1.114
Size and shape of layout	4.70	1.149
Comfortable movement around the restaurant	5.30	0.837
Ambience	5.40	0.894
Temperature comfort	5.40	0.814
Pleasant scent	5.33	1.028
Background music	5.50	1.137
Noise level	5.30	0.988
Table arrangement	5.57	0.858
Table covers	5.03	0.964
Lighting	5.23	1.006

Table 4.5: Overall satisfaction evaluation of Acar Pide and Kebap

User Satisfaction Aspect	Mean Score	Standard Deviation
Product, service and price	5.50	0.731
Physical Environment	5.33	1.241

4.2.2 Ciğerci Yakup

The participating sample from this restaurant form 25% of the total sample, where the majority of the participants indicated that they visit it a few times a week (43.33%), as shown in Figure 4.5.

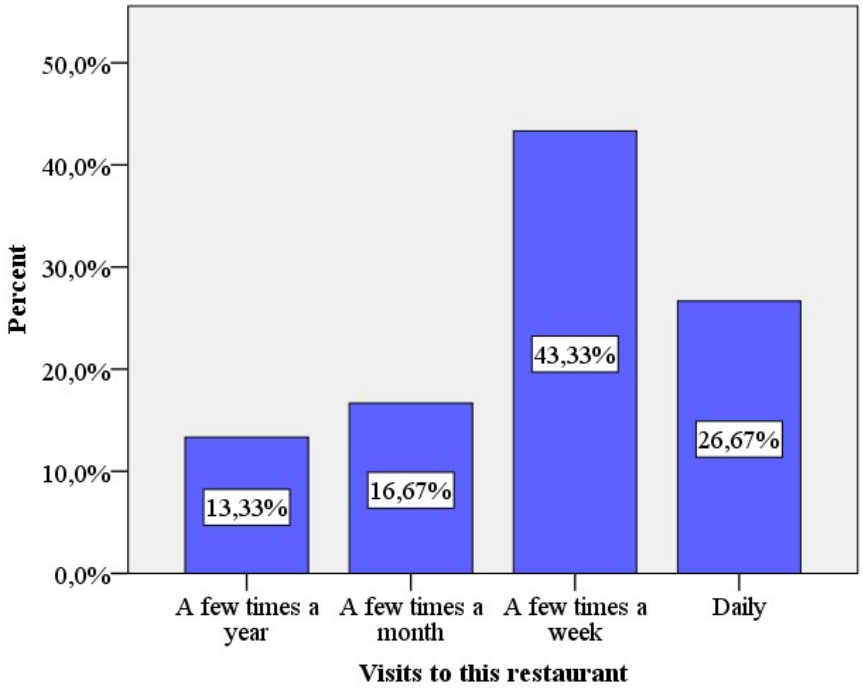


Figure 4.5: Frequency of visit to Ciğerci Yakup

Out of the questionnaire's color selection, all of the eleven colors were selected, as shown in Table 4.6. This wide collection shows confusion of colors by some of the participants. The white color was chosen 33.3% of the time, followed black and red (23.3% each), and brown (20.0%). No definite color was chosen like in the previous case. Nevertheless, a mixture of several colors has formed the color theme. The properties of the color theme have been evaluated, Table 4.7, where all properties were estimated to be above 80%, indicating suitable lighting and vivid mixture of colors.

Table 4.6: Color descriptions of Ciğerci Yakup based on hue

		Responses		Percent of Cases
		N	Percent	
Color	White	10	22.2%	33.3%
	Black	7	15.6%	23.3%
	Blue	5	11.1%	16.7%
	Yellow	4	8.9%	13.3%
	Green	3	6.7%	10.0%
	Red	7	15.6%	23.3%
	Orange	1	2.2%	3.3%
	Violet	1	2.2%	3.3%
	Brown	6	13.3%	20.0%
	Magenta	1	2.2%	3.3%
Total		45	100.0%	150.0%

Table 4.7: Color description of Ciğerci Yakup based on color property

Color Property	Mean Score	Standard Deviation	Percent
Brightness	5.97	1.474	85.29%
Purity	6.10	1.213	87.14%
Reflection	5.63	1.810	80.43%

*. Percent is calculated by dividing the mean score of the color property by 7 based on 7-point judgement scale.

Table 4.8 shows the user satisfaction evaluation performed by the participants at Ciğerci Yakup. All of the ten aspects were evaluated with a minimum mean score of 5.57 reflecting at high user satisfaction level. Furthermore, the physical environment indicators had a minimum 5.30 for the paintings and pictures, as shown in Table 4.9. privacy level and color suitability scored the second and third lowest, respectively.

Nonetheless, food freshness and employees' neatness were the highest user satisfaction indicators, while lighting, ambiance and temperature comfort were the highest physical environment indicators. The overall satisfaction evaluation shows users are more satisfied from the product, prices and services than the physical environment of the restaurant, indicating possible improvements in the interior elements that had the lowest scores, as shown in Table 4.10.

Table 4.8: User satisfaction evaluation of Ciğerci Yakup

User Satisfaction Indicator	Mean Score	Standard Deviation
Food taste	6.13	1.332
Portion size	5.57	1.406
Food presentation	6.13	1.106
Utensils cleanness	5.83	1.234
Food freshness	6.37	0.964
Restaurant food variety	5.67	1.295
Employees' neatness	6.27	1.143
Employees' communication	5.80	1.270
Service	6.20	0.997
Price Suitability with provided quality	5.97	1.098

Table 4.9: Physical Environment evaluation of Ciğerci Yakup

Physical Environment Indicator	Mean Score	Standard Deviation
Aesthetics of the facility	6.00	1.438
Furniture cleanness	5.77	1.223
Colour attractiveness	5.63	1.542
Colour suitability for restaurant theme	5.47	1.224
Furniture quality	5.80	1.495
Painting and picture	5.30	1.725
Wall decorations attractiveness	5.63	1.586
Restaurant Layout	5.70	1.343
Space spaciousness	5.80	1.584
Privacy level	5.40	2.078
Size and shape of layout	5.87	1.634
Comfortable movement around the restaurant	5.97	1.402
Ambience	6.17	0.913
Temperature comfort	6.20	0.997
Pleasant scent	5.97	0.964
Background music	5.57	1.906
Noise level	5.57	1.716
Table arrangement	6.10	1.269
Table covers	5.57	1.569
Lighting	6.40	0.770

Table 4.10: Overall satisfaction evaluation of Ciğerci Yakup

User Satisfaction Aspect	Mean Score	Standard Deviation
Product, service and price	6.20	1.095
Physical Environment	5.87	1.502

4.2.3 Hoşdere Kebap

The participating sample from this restaurant form 25% of the total sample, where the majority of the participants indicated that they visit it a few times a week (53.33%), as shown in Figure 4.6.

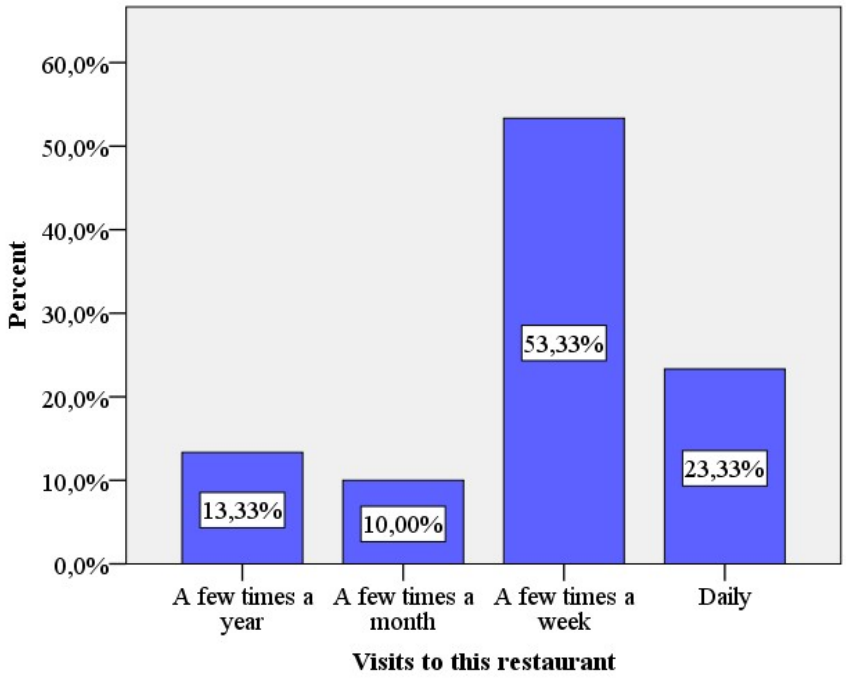


Figure 4.6: Frequency of visit to Hoşdere Kebap

In the color selection section, ten of the eleven colors were selected, as shown in Table 4.11. The yellow, white and green color were each chosen 20.0% of the time, followed by blue and violet (13.3% each). No definite color was chosen for this restaurant. Nevertheless, a mixture of several colors has formed the color theme. The properties of the color theme have been evaluated, Table 4.12, where brightness and purity has been estimated at 55.29% and 74.29%, respectively. Such as result shows the low lighting level affecting the purity of the colors in the interior environment.

Table 4.11: Color descriptions of Hoşdere Kebap based on hue

		Responses		Percent of Cases
		N	Percent	
Color	White	6	17.6%	20.0%
	Blue	4	11.8%	13.3%
	Yellow	6	17.6%	20.0%
	Green	6	17.6%	20.0%
	Red	3	8.8%	10.0%
	Orange	2	5.9%	6.7%
	Violet	4	11.8%	13.3%
	Brown	1	2.9%	3.3%
	Turquoise	1	2.9%	3.3%
	Magenta	1	2.9%	3.3%
Total		34	100.0%	113.3%

Table 4.12: Color description of Hoşdere Kebap based on color property

Color Property	Mean Score	Standard Deviation	Percent
Brightness	3.87	1.167	55.29%
Purity	5.20	0.961	74.29%
Reflection	5.43	1.695	77.57%

*. Percent is calculated by dividing the mean score of the color property by 7 based on 7-point judgement scale.

Table 4.13 shows the user satisfaction evaluation performed by the participants at Hoşdere Kebap. All of the ten aspects were evaluated with a minimum mean score of 4.50 reflecting at moderate user satisfaction level. Furthermore, the physical environment indicators had a minimum 3.93 for the aesthetics of the facility, as shown in Table 4.14. Privacy level and movement around the restaurant scored the second and third lowest, respectively.

Nonetheless, portion size and service were the highest User satisfaction indicators, while temperature comfort, painting and pictures, and lighting were the highest physical environment indicators. The overall satisfaction evaluation shows users are more satisfied from the physical environment of the restaurant than the product, prices and services provided, indicating possible improvements in the user satisfaction elements that had the lowest scores, as shown in Table 4.15.

Table 4.13: User satisfaction evaluation of Hoşdere Kebap

User Satisfaction Indicator	Mean Score	Standard Deviation
Food taste	4.50	1.280
Portion size	5.37	1.098
Food presentation	5.17	1.206
Utensils cleanness	5.20	1.495
Food freshness	5.23	1.278
Restaurant food variety	5.10	1.373
Employees' neatness	4.97	1.450
Employees' communication	5.00	1.576
Service	5.27	1.596
Price Suitability with provided quality	5.10	1.185

Table 4.14: Physical Environment evaluation of Hoşdere Kebap

Physical Environment Indicator	Mean Score	Standard Deviation
Aesthetics of the facility	3.93	1.311
Furniture cleanness	5.00	1.232
Colour attractiveness	5.03	1.159
Colour suitability for restaurant theme	5.10	1.423
Furniture quality	4.97	1.586
Painting and picture	5.30	1.088
Wall decorations attractiveness	4.87	1.479
Restaurant Layout	5.07	1.363
Space spaciousness	4.70	1.664
Privacy level	4.60	1.850
Size and shape of layout	5.23	1.501
Comfortable movement around the restaurant	4.67	1.807
Ambience	5.23	1.251
Temperature comfort	5.40	1.354
Pleasant scent	5.27	1.388
Background music	5.27	1.230
Noise level	5.03	1.377
Table arrangement	4.97	1.474
Table covers	4.77	1.736
Lighting	5.30	1.512

Table 4.15: Overall satisfaction evaluation of Hoşdere Kebap

User Satisfaction Aspect	Mean Score	Standard Deviation
Product, service and price	4.73	0.944
Physical Environment	5.27	1.202

4.2.4 Şampiyon Dönercisi

The participating sample from this restaurant form 25% of the total sample, where the majority of the participants indicated that they visit it a few times a week (50%), as shown in Figure 4.7.

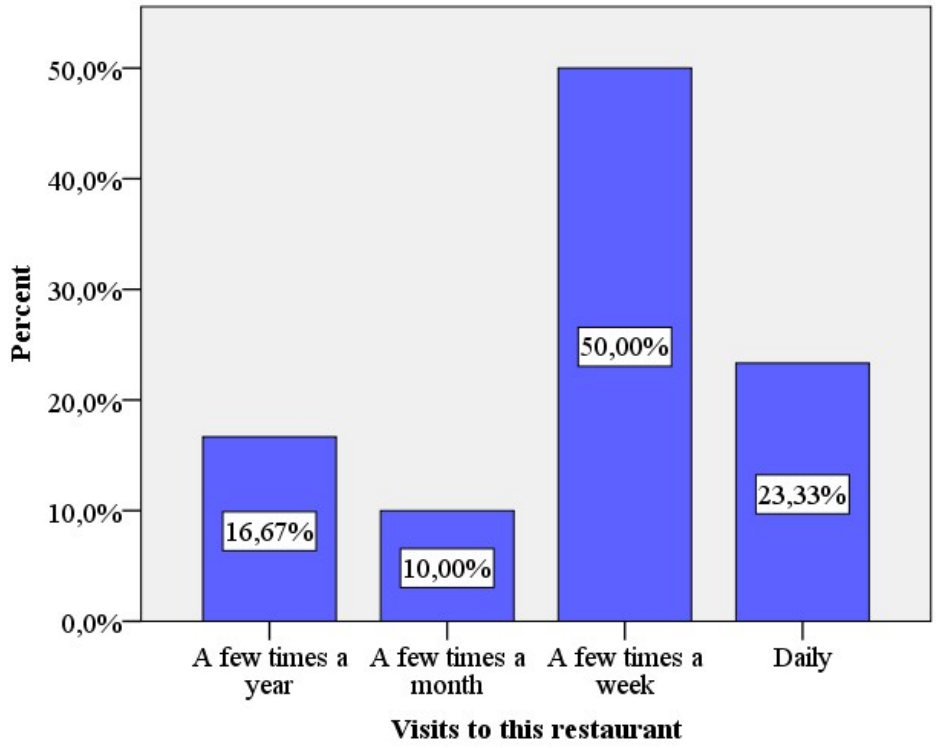


Figure 4.7: Frequency of visit to Şampiyon Dönercisi

The participants selected the most dominant colors within the restaurant's interior environment, where seven of the eleven colors were selected, as shown in Table 4.16. The red color was chosen 60.0% of the time, followed by white (46.7%), and brown (30.0%). The color choice shows the red color dominance along with the white color, and several brown interior elements. Therefore, these colors form the main theme

of the restaurant. The properties of the color theme have been evaluated, Table 4.17, all properties have been estimated at around 70%. The results in this case and the other cases confirms the importance of lighting in showing the colors of the interior environment.

Table 4.16: Color descriptions of Şampiyon Dönercisi based on hue

		Responses		Percent of Cases
		N	Percent	
Color	White	14	29.2%	46.7%
	Black	2	4.2%	6.7%
	Green	1	2.1%	3.3%
	Red	18	37.5%	60.0%
	Violet	2	4.2%	6.7%
	Brown	9	18.8%	30.0%
	Turquoise	2	4.2%	6.7%
Total		48	100.0%	160.0%

Table 4.17: Color description of Şampiyon Dönercisi based on color property

Color Property	Mean Score	Standard Deviation	Percent
Brightness	4.87	1.196	69.57%
Purity	5.03	1.217	71.86%
Reflection	4.80	0.961	68.57%

*. Percent is calculated by dividing the mean score of the color property by 7 based on 7-point judgement scale.

Table 4.18 shows the user satisfaction evaluation performed by the participants at Şampiyon Restaurant. All of the ten aspects were evaluated with a minimum mean score of 4.50 reflecting at moderate user satisfaction level. Furthermore, the physical environment indicators had a minimum 4.23 for the movement around the restaurant, as shown in Table 4.19. Size and shape of the layout and pleasant scent scored the second and third lowest, respectively.

Nonetheless, service, food freshness employees' neatness and employees' communication were the highest user satisfaction indicators, while color attractiveness and color suitability with the restaurant's theme were the highest physical environment indicators. The overall satisfaction evaluation shows users are more satisfied from the physical environment of the restaurant than the product, prices and services provided, indicating possible improvements in the user satisfaction elements that had the lowest scores, as shown in Table 4.20.

Table 4.18: User satisfaction evaluation of Şampiyon Dönercisi

User Satisfaction Indicator	Mean Score	Standard Deviation
Food taste	4.57	1.104
Portion size	4.60	1.221
Food presentation	4.50	0.900
Utensils cleanness	4.83	1.085
Food freshness	5.07	1.258
Restaurant food variety	4.87	1.137
Employees' neatness	5.07	1.015
Employees' communication	5.07	1.172
Service	5.27	1.081
Price Suitability with provided quality	5.07	1.258

Table 4.19: Physical environment evaluation of Şampiyon Dönercisi

Physical Environment Indicator	Mean Score	Standard Deviation
Aesthetics of the facility	4.97	1.299
Furniture cleanness	5.03	1.129
Color attractiveness	5.30	1.119
Color suitability for restaurant theme	5.17	1.206
Furniture quality	4.93	1.258
Painting and picture	4.90	1.062
Wall decorations attractiveness	5.07	1.337
Restaurant Layout	4.97	1.098
Space spaciousness	4.93	0.944
Privacy level	5.00	1.145
Size and shape of layout	4.63	1.351
Comfortable movement around the restaurant	4.23	1.165
Ambience	4.87	1.383
Temperature comfort	4.90	1.125
Pleasant scent	4.70	1.264
Background music	5.00	1.259
Noise level	4.87	1.252
Table arrangement	5.03	1.066
Table covers	5.00	1.017
Lighting	5.03	1.426

Table 4.20: Overall satisfaction evaluation of Şampiyon Dönercisi

User Satisfaction Aspect	Mean Score	Standard Deviation
Product, service and price	4.93	1.112
Physical Environment	5.40	1.037

4.3 Hypotheses Testing and Discussion

In order to highlight the significant differences in user satisfaction and satisfaction from the physical environments at the case studies, one-way ANOVA testing has been performed for gender, restaurant's visiting frequency and the color properties estimated by the participants. These statistical analyses facilitate the testing of the hypotheses. All tables containing the analyses results can be found in the second appendix of the thesis (see Appendix C).

On testing the significant differences between the two genders based on user satisfaction with a confidence level of 95%, only food representation showed a significant difference (Sig. ,042), as shown in Table C1. Thus, the hypothesis stating "H1: There is a significant difference between males and females based on restaurant user satisfaction indicators and overall satisfaction levels." is rejected. Furthermore, as shown in Table C6, three out of the twenty physical environment indicators have shown significant levels after a one-way ANOVA test ranging between ,004 and ,050. Therefore, the hypothesis stating "H2: There is a significant difference between males and females based on restaurant physical environment evaluation indicators" is partially accepted for the following aspects; furniture cleanliness, paintings and pictures, and table arrangement.

Significant differences depending on restaurant usage were tested through a one-way ANOVA for user satisfaction and physical environment. As shown in Table C2, none of the twelve indicators showed significant differences. Thus, the hypothesis stating "H3: There is a significant difference based on restaurant usage frequency in user satisfaction indicators and overall satisfaction levels" is rejected. Similarly, no significant differences were found for the twenty physical environment indicators based on restaurant usage, as shown in Table C7. Therefore, the hypothesis stating "H4: There is a significant difference based on restaurant usage frequency in physical environment evaluation indicators" is also rejected.

Moreover, one-way ANOVA was used to test significant differences in user satisfaction and physical environment evaluation depending on color properties assessed by the participants. Three properties were evaluated, which are brightness, purity and reflection. Tables C3, C4 and C5 show user satisfaction ANOVA results for color properties, where the majority of the indicators showed significant differences for the three properties. Therefore, the hypothesis stating "H5: There is a significant difference based on interior environment color description in user satisfaction indicators and overall satisfaction levels" is accepted at $p<0.05$. For the physical environment, Tables C8, C9 and C10 show the results of the ANOVA testing, where almost all of the indicators showed significant differences at the $p<0.05$ level. Therefore, the hypothesis stating "H6: There is a significant difference based on interior environment color description in physical environment evaluation indicators" is accepted.

The results found in the research confirm several findings from the literature. The effect of color generally on users' behavior and cognition was presented by O'Conner (2015). As the different color aspects that are closely related to lighting were tested in this study, this relation has been proven once again as stated by Manav (2013). The social and emotional behavior of restaurant users have found to be differing based on the interior design elements of the space, which is similar to the findings of Wardono et al. (2012). Furthermore, the relationship between user satisfaction and the design of the physical environment is proven through the current study. Similar results were found by Pecotic et al. (2014). The relationship between color and satisfaction is also shown in Omar et al. (2015).

4.4 Comparison between Restaurants

The results of user satisfaction and physical environment evaluations for the four restaurant were compared, as shown in Tables 4.21 and 4.22, respectively. For user satisfaction, Ciğerci Yakup has aggregated the highest mean scores in all indicators with a maximum mean score of 6.29 and a minimum mean score of 5.62. Hoşdere Kebap had the lowest mean scores for food taste, employees' neatness, employees' communication and service, while Şampiyon Dönercisi had the lowest mean scores for portion size, food representation, utensils cleanness, food freshness, food variety and price suitability.

Table 4.21: User satisfaction comparison between the four restaurants

User Satisfaction Indicator	Mean Scores			
	A	B	C	D
Food taste	5.11	**6.05**	4.55	4.59
Portion size	5.36	**5.62**	5.32	4.67
Food presentation	5.36	**6.10**	5.18	4.52
Utensils cleanness	5.59	**5.90**	5.24	4.93
Food freshness	5.41	**6.31**	5.18	5.15
Restaurant food variety	5.57	**5.69**	5.24	4.85
Employees' neatness	5.45	**6.29**	4.97	5.07
Employees' communication	5.50	**5.88**	4.92	5.07
Service	5.50	**6.12**	5.08	5.26
Price Suitability with provided quality	5.52	**5.93**	5.29	5.07

A-Acar pide & Kebap; B-Giğerci Yakup; C-Hoşdere Kebap; D-Şampiyon Dönercisi
Bold: Highest score; Underlined: Lowest score

In the physical environment evaluation, Ciğerci Yakup has aggregated the highest mean scores in all indicators with a maximum mean score of 6.38 and a minimum mean score of 5.45. Hoşdere Kebap had the lowest mean scores for nine indicators, including indicators measuring color attractiveness and suitability, while Şampiyon Dönercisi had the lowest mean scores for eleven indicators, especially on indicators concerning layout and freedom of movement. Moreover, Table 4.23 provides a general comparison between the four restaurants based on their dominant hues, color properties and overall user satisfaction and physical environment satisfaction scores.

Table 4.22: Physical environment evaluation comparison between the four restaurants

Physical Environment Indicator	Mean Scores			
	A	B	C	D
Aesthetics of the facility	5.20	**5.95**	4.13	5.07
Furniture cleanness	5.52	**5.79**	5.08	5.15
Color attractiveness	5.48	**5.64**	5.18	5.33
Color suitability for restaurant theme	5.59	**5.67**	5.21	5.30
Furniture quality	5.43	**5.76**	5.08	5.04
Painting and picture	5.07	**5.45**	5.42	5.00
Wall decorations attractiveness	5.32	**5.52**	4.79	5.04
Restaurant Layout	5.23	**5.74**	4.89	5.11
Space spaciousness	5.48	**5.86**	4.58	4.93
Privacy level	5.02	**5.60**	4.74	5.07
Size and shape of layout	4.95	**5.98**	5.26	4.78
Comfortable movement around the restaurant	5.25	**5.93**	4.55	4.33
Ambience	5.43	**6.10**	5.29	5.00
Temperature comfort	5.48	**6.10**	5.16	4.93
Pleasant scent	5.36	**5.93**	5.16	4.81
Background music	5.55	**5.60**	5.16	5.04
Noise level	5.43	**5.48**	5.08	5.00
Table arrangement	5.50	**5.95**	5.03	5.07
Table covers	5.11	**5.71**	4.82	5.07
Lighting	5.30	**6.38**	5.18	5.11

A-Acar pide & Kebap; B-Giğerci Yakup; C-Hoşdere Kebap; D-Şampiyon Dönercisi
Bold: Highest score; Underlined: Lowest score

Table 4.23: Overall comparison between the four restaurants

Parameter		Restaurants			
		A	B	C	D
Dominant color hues *		Red White	White Black Red Brown	White Yellow Green	Red White Brown
Color properties percentage	Brightness	82.43%	85.29%	55.29%	69.57%
	Purity	72.86%	87.14%	74.29%	71.86%
	Reflection	63.86%	80.43%	77.57%	68.57%
User satisfaction score		5.50	**6.20**	<u>4.73</u>	4.93
Physical environment evaluation score		5.33	**5.87**	<u>5.27</u>	5.40

A-Acar pide & Kebap; B-Giğerci Yakup; C-Hoşdere Kebap; D-Şampiyon Dönercisi
*. Colors are put in order from most dominant to least dominant
Bold: Highest score; <u>Underlined</u>: Lowest score

CHAPTER 5

CONCLUSION

Interior design elements have been found influential on the satisfaction and comfort of humans within the interior environment, where color forms an important part of it. In this thesis, the effect of interior design elements in restaurant, especially color, on user satisfaction and the evaluation of the physical environment was studied. The main aim of the study was to assess the impact of interior design elements and color on user satisfaction. There are several interior design elements that should be considered in interior design; shape and background, continuity, repetition, sequence, rhythm, dominance, similarity and proportion. All of the design elements impact each other and have impact the perception of the users.

Furthermore, there are several factors that affect the personal perception in interior environments. The literature shows that factors such as age, gender and education can contribute into the way the interior design elements are perceived. Therefore, designers strive to apply positive design elements that empower virtue, pleasure and personal significance. There are several themes and design concepts that can be used in a restaurant, varying from classical to contemporary and modern designs. Each of the design concepts provide the users with different mental and mood status that ultimately influences the dining experience. Studies show proofs of psychological impacts of interior design elements on the user's experience, which were presented in the literature review of this research.

Based on the aim of this study, there are four main elements that were identified to determine the level of user satisfaction in restaurants; product quality, service, price and physical environment. There are several elements that are also identified to determine the user satisfaction level of the physical environment; aesthetics, service staff looks, lighting, ambiance and layout. Several other factors were further identified as indicators for physical environment satisfaction. In this research, four restaurants were selected to perform the case study. Moreover, 120 participants distributed on the selected restaurants have evaluated the interior design elements and their user satisfaction using a questionnaire methodology.

The statistical analysis of the results show that gender has no influence on user satisfaction, where some of the physical environment indicators showed significant differences between males and females. Moreover, significant differences were partially found to be influenced by the age of the participants; however, no influence was found by level of education or restaurant usage frequency on user satisfaction or physical environment evaluation. Nonetheless, differences in lighting properties; brightness, purity and reflection showed significant differences in the way participants indicated their user satisfaction and evaluated the physical environment. The significance of this study emerges from the relationships that has been established between the demographical data of the participants, as well as the color evaluation, with the user satisfaction levels in restaurant contexts. Moreover, the study separated user satisfaction elements from the satisfaction from the physical environment in order to show that interior design elements play a major role in driving user satisfaction in the interior environment and restaurants. Future studies can research a similar methodology in other retail contexts, including malls and shops. Furthermore, it is possible to incorporate lighting illuminance readings in order to compare them with the users' evaluations, establishing further relationships.

REFERENCES

Abdulpader, O. Q., Sabah, O. A., & Abdullah, H. S. (2014). Impact of Flexibility Principle on the Efficiency of Interior Design. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 5*(3), 195-212.

Alansari, A. E. (2016). Factors Influencing Place Attachment to Middle-Eastern Restaurants in the United States: A Case Study. *International Design Journal, 6*(4), 49-54.

Almohaimmeed, B. M. (2017). Restaurant Quality and Customer Satisfaction. *International Review of Management and Marketing, 7*(3), 42-49.

Al-Zamil, F. A. (2017). The Impact of Design Elements on the perception of spaciousness in Interior Design. *International Design Journal, 7*(2), 177-187.

Bhatia, A. (2003). *Effects of Interior Environment on the Dining Experience and Design of a Prototype Seafood Restaurant (Master's Thesis).* Florida: The Florida State University.

Bleicher, S. (2011). *Contemporary Color: Theory and Use* (2nd ed.). USA: Delmar Cengage Learning.

Butt, H. S., & Murtaza, M. (2011). Measuring customer satisfaction with regards to restaurant industry in Bahawalpur. *European Journal of Business and Management, 3*(5), 54-64.

Camgoz, N. (2000). *Effects of hue, saturation and brightness on attention and preference (PhD thesis).* Ankara: Nilkent Univeristy.

Chang, Y. C., Liang, C. H., Yan, S. A., & Chang, Y. S. (2010). Synthesis and Photoluminescence Characteristics of High Color Purity and Brightness Li3Ba2Gd3(MoO4)8:Eu3+ Red Phosphors. *The Journal of Physical Chemistry, 114*(8), 3645-3652.

Colombo, B., Laddaga, S., & Antonietti, A. (2015). Psychology and design. The influence of the environment's representation over emotion and cognition. An ET study on Ikea design. *Procedia Manufacturing, 3*, 2259 – 2266.

Corney, D., Haynes, J. D., Rees, G., & Lotto, R. B. (2009). The Brightness of Colour. *PLOS One*. doi:https://doi.org/10.1371/journal.pone.0005091

Dreiskaemper, D., Strauss, B., Hagemann, N., & Busch, D. (2013). Influence of Red Jersey Color on Physical Parameters in Combat Sports. *Journal of Sport & Exercise Psychology, 35*, 44-49.

Duyan, F., & Unver, R. (2016). A research on the effect of classroom wall colours on student's attention. *ITU A|Z, 13*(2), 73-78.

Dzulkifli, M. A., & Mustafar, M. F. (2013). The Influence of Colour on Memory Performance: A Review. *Malaysian Journal of Medical Sciences, 20*(2), 3-9.

Evans, G. W., Lepore, S. J., & Schroeder, A. (1996). The Role of Interior Design Elements in Human Responses to Crowding. *Journal of Personality and Social Psychology, 70*(1), 41-46.

Felming, R. W. (2014). Visual perception of materials and their properties. *Vision Research, 94*, 62-75.

Fujii, T., Nakano, H., Wakita, M., & Maeshima, E. (2017). Effects of Color on the Athletic Performance of Short-Distance Runners. *Journal of Athletic Enhancement, 6*(6).

Ghimire, A. J. (2012). *Service quality and customer satisfaction in the restaurant business - Case study of Sagarmatha Nepalese Restaurant in Vantaa (Master's Thesis).* Kokkola, Finalnd: Central Ostrobothnia University of Applied Sciences.

Gibbs, J. (2005). *Interior Design.* London, UK: Laurence King Publishing Ltd.

Jalil, N. A., Yunus, R. M., & Said, N. S. (2012). Environmental Colour Impact upon Human Behaviour: A Review. *Procedia - Social and Behavioral Sciences, 35*, 54-62.

Judd, D. B. (1940). Hue, saturation and lightness of surface colors with chromatic illumination. *Journal of Research of the N.ational Bureau of Standards, 24*, 293-333.

Karacor, E. K. (2016). Public vs. Private: The Evaluation of Different Space Types in Terms of Publicness Dimension. *European Journal of Sustainable Development, 5*(3), 51-58.

Lee, S., Alzoubi, H. H., & Kim, S. (2017). The Effect of Interior Design Elements and Lighting Layouts on Prospective Occupants' Perceptions of Amenity and Efficiency in Living Rooms. *Sustainability, 9*, 1-30.

Liu, W., Ji, J., Chen, H., & ye, C. (2014). Optimal Color Design of Psychological Counseling Room by Design of Experiments and Response Surface Methodology. *PLOS ONE, 9*(3), e90646 (1-9).

Mahmoud, H. T. (2017). Interior Architectural Elements that Affect Human Psychology and Behavior. *ARChive, 1*(1), 1-10.

Malekshahi, A. (2013). *Investigation on Restaurant Layout Design (Master's Thesis).* Gazimağusa, North Cyprus: Eastern Mediterranean University.

Manav, B. (2013). A Research on Light-Color Perception: Can Visual Images Be Used Instead of 1/1 Model Study for Space Perception? *Psychology, 4*(9), 711-716.

New York by Design. (2015). *Classic Restaurant Interior Design Carlyle Furniture Manhattan*. Retrieved from New York by Design: http://www.newyorkmarkt.com/ultra-elegant-english-manor-house-interior-design-style-of-carlyle-restaurant-manhattan-nyc/classic-restaurant-interior-design-carlyle-furniture-manhattan/

O'Connor, Z. (2015). *Colour in the built environment: Beyond aesthetics.* Sydney: University of Technology.

Odabasioglu, S. (2009). *Effects of colored lighting on the perception of interior spaces (Master's Thesis).* Ankara: Bilkent University.

Omar, M. S., Ariffin, H. F., & Ahmad, R. (2015). The Relationship between Restaurant Ambience and Customers' Satisfaction in Shah Alam Arabic Restaurants, Selangor. *International Journal of Administration and Governance, 1*(4), 1-8.

Park Regis. (2015). *Restaurant*. Retrieved from Park Regis Singapore: https://www.parkregissingapore.com/gallery/restaurant/

Pecotic, M., Bazdan, V., & Samardzija, J. (2014). Interior design in restaurants as a factor influencing customer satisfaction. *RIThink, 4*, 10-14.

Petermans, A., & Pohlmeyer, A. E. (2014). Design for subjective well-being in interior architecture. *Proceedings of the 6th Annual Architectural Research Symposium* (pp. 206-218). Finalnd: Atut.

Picrevise. (2014). *Elegant contemporary decor - Asian restaurant interior*. Retrieved from Picrevise: http://www.picrevise.net/edit.php

Piotrowski, C. M., & Rogers, E. A. (2007). *Designing Commercial Interiors.* Hoboken, New Jersey: John Wiley & Sons Inc.

Pridemore, R. W. (2007). Effects of luminance, wavelength and purity on the color attributes: Brief review with new data and perspectives. *Color Research & Application, 32*(3).

Radub. (2015, May 16). *People Shopping In Luxury Shopping Mall Interior. Architectural, floor*. Retrieved from dreamstime: https://www.dreamstime.com/editorial-stock-photo-people-shopping-luxury-shopping-mall-interior-bucharest-romania-may-image54161268

Robenson, J. R., & Kleynhans, I. C. (2015). Restaurateurs' perceptions of location and design. *African Journal of Hospitality, Tourism and Leisure, 4*(1), 1-13.

RSC. (2016). *Private Office Environment*. Retrieved from RSC: http://www.rscllcorp.com/portfolio-posts/private-office-environment/

Ryu, K., & Han, H. (2010). Influence of the Quality of Food, Service, and Physical Environment on Customer Satisfaction and Behavioral Intention in Quick-Casual Restaurants: Moderating Role of Perceived Price. *Journal of Hospitality & Tourism Research, 34*(3), 310-329.

Sabir, R. I., Irfan, M., Akhtar, N., Pervez, M. A., & Rehman, A. (2014). Customer Satisfaction in the Restaurant Industry; Examining the Model in Local Industry Perspective. *Journal of Asian Business Strategy, 4*(1), 18-31.

Senduk, D. C., Saerang, D. P., & Lambey, L. (2016). The influence of restaurant ambiance and service quality on customer satisfaction at Pondok Hijau restaurant Manado. *Jurnal Berkala Ilmiah Efisiensi, 16*(3), 240-248.

Söker, M. B. (2009). *The role of color on the assessment of retail spaces: restaurant atmospherics.* Ankara: Bilkent University.

Taber, K. S. (2017). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, 1-24.

Tantanatewin, W., & Inkarojrit, V. (2018). The influence of emotional response to interior color on restaurant entry decision. *International Journal of Hospitality Management, 69*, 124-131.

Tüzünkan, D., & Albayrak, A. (2016). The Importance of Restaurant Physical Environment for Turkish Customers. *Journal of Tourism Research & Hospitality, 5*(1), 1-7.

Von Castell, C., Oberfeld, D., & Hecht, H. (2014). The Effect of Furnishing on Perceived Spatial Dimensions and Spaciousness of Interior Space. *PLOS ONE, 9*(11), 1-16.

Wardono, P., Hibino, H., & Koyama, S. (2012). Effects of Interior Colors, Lighting and Decors on Perceived Sociability, Emotion and Behavior Related to Social Dining. *Procedia - Social and Behavioral Sciences, 38*, 362-372.

Zlregata. (2018). *New Picture Of Inspiring Projects Berthelots Modern Restaurant Design In Bucharest*. Retrieved from Zlregata: http://zlregata.com/room-decoration-ideas-for-small-bedroom-gallery/7867/new-picture-of-inspiring-projects-berthelots-modern-restaurant-design-in-bucharest-7-jpg-room-decoration-ideas-for-small-bedroom-decoration-decoration-ideas/

APPENDIX A

(QUESTIONNAIRE TEMPLATE)

Questionnaire on Relation between the Restaurant Physical Environment and User Satisfaction

Dear Sir/ Madam

This questionnaire is part of a graduate study titled "Colour of Restaurants as a Factor Influencing User Satisfaction" in Çankaya University, Ankara. The main aim of the research is to study the impact of restaurants' interior design elements, specifically color, on User satisfaction through subjective evaluation and architectural analysis. We would appreciate your participation in evaluating the User service and the physical environment in the restaurant that you are using right now.

Thank you for time and effort.

Best Regards,

The researcher

Part A: Demographics and restaurant usage

1	Gender	□ Male	□ Female
2	How often do you eat in restaurants?	□ Daily	□ Few times a week
		□ Few times a month	□ Few Times a year
3	How often do you visit this restaurant?	□ Daily	□ Few times a week
		□ Few times a month	□ Few Times a year

Part B: Colour description

1	How do you describe the dominant color in THIS restaurant?	□ White		□ Black		□ Blue		
		□ Yellow		□ Green		□ Red		
		□ Orange		□ Violet		□ Brown		
		□ Turquoise		□ Magenta				
Please evaluate the following aspects of the color in the restaurant		Low						High
		1	2	3	4	5	6	7
2	Brightness							
3	Purity							
4	Reflection							

Part C: User Satisfaction Evaluation

Kindly evaluate the following aspects based on their quality		Low Quality						High Quality
		1	2	3	4	5	6	7
1	Food taste							
2	Portion size							
3	Food representation							
4	Utensils cleanness							
5	Food freshness							
6	Restaurant food variety							
7	Employees neatness							
8	Employees communication							
9	Service							
10	Price suitability with provided quality							

Part D: Physical Environment Evaluation

Kindly evaluate the following aspects based on their quality		Low Quality						High Quality
		1	2	3	4	5	6	7
1	Aesthetics of the facility							
2	Furniture cleanness							
3	Colour attractiveness							
4	Colour suitability for restaurant theme							
5	Furniture quality							
6	Painting and picture							
7	Wall decorations attractiveness							
8	Restaurant Layout							
9	Space spaciousness							
10	Privacy level							
11	Size and shape of layout							

Part D: Physical Environment Evaluation

Kindly evaluate the following aspects based on their quality		Low Quality						High Quality
		1	2	3	4	5	6	7
12	Comfortable movement around the restaurant							
13	Ambience							
14	Temperature comfort							
15	Pleasant scent							
16	Background music							
17	Noise level							
18	Table arrangement							
19	Table covers							
20	Lighting							

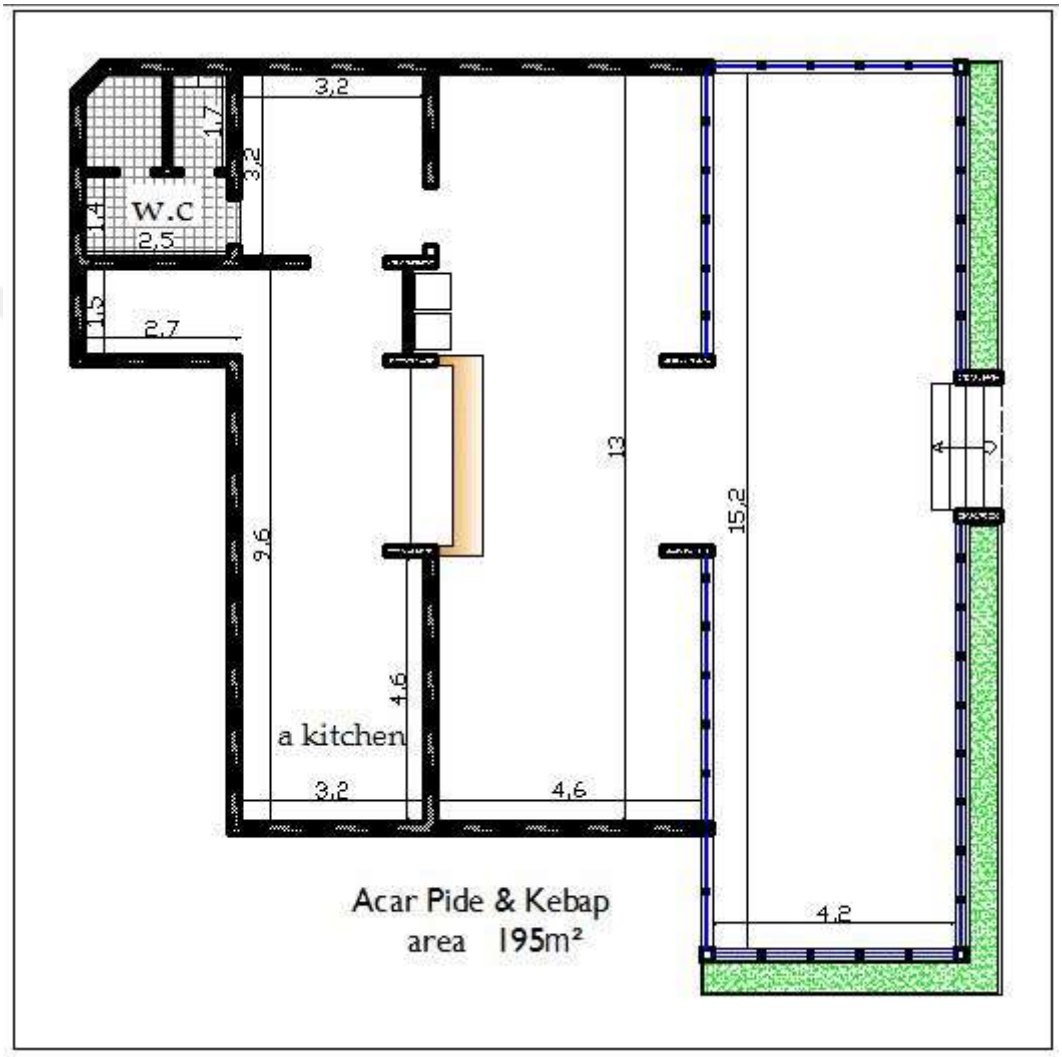
Part E: Overall Satisfaction

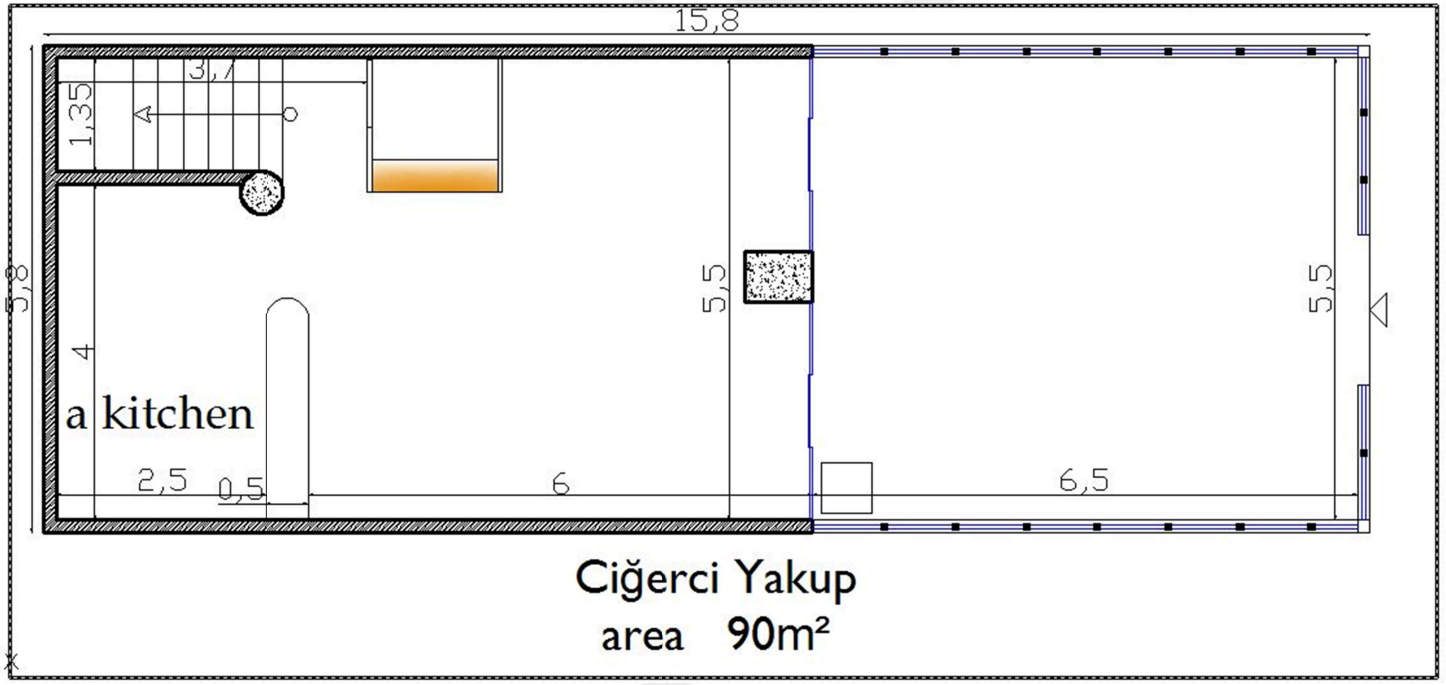
Kindly indicate your overall satisfaction level from the restaurant's …….		Strongly unsatisfied						Strongly satisfied
		1	2	3	4	5	6	7
1	Product, service and price							
2	Physical environment							

THANK YOU
FOR YOUR TIME AND EFFORT

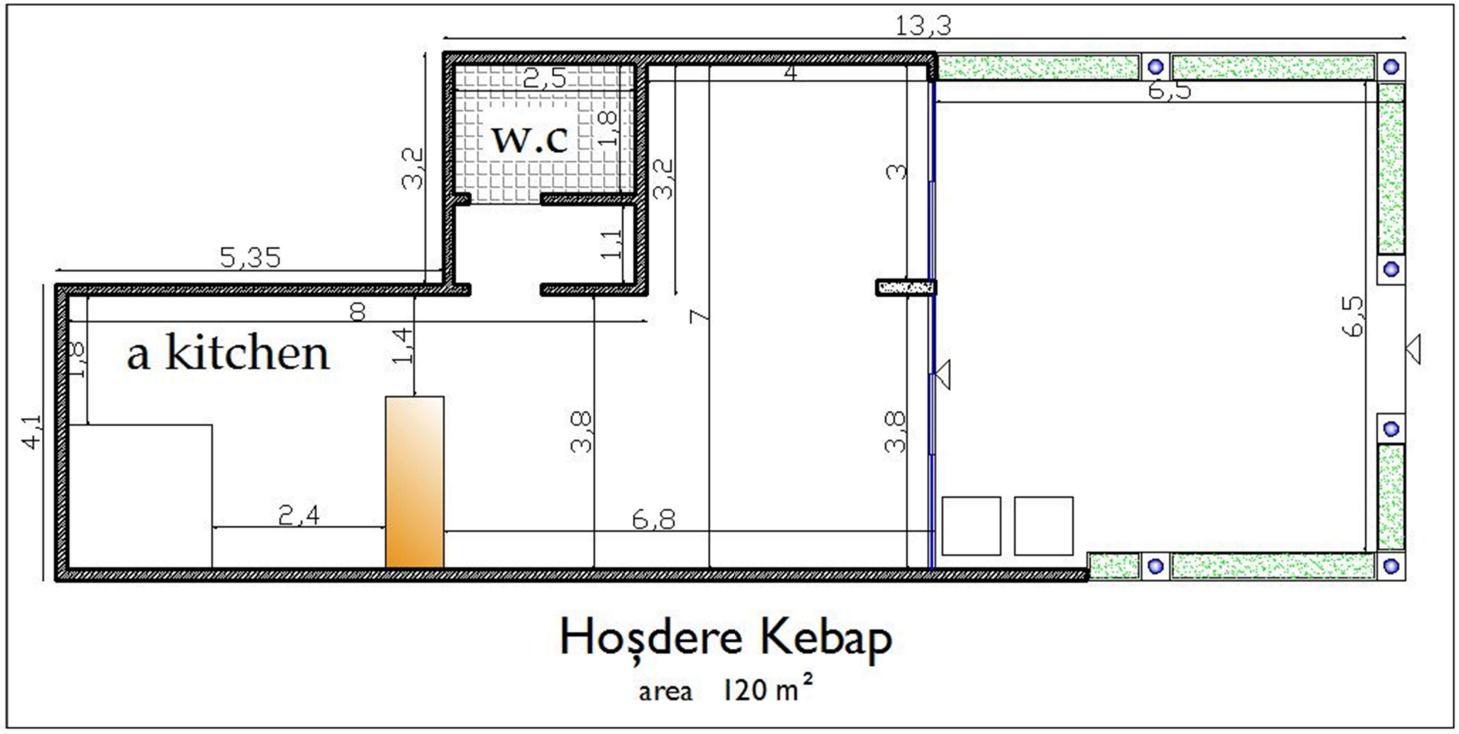
APPENDIX B

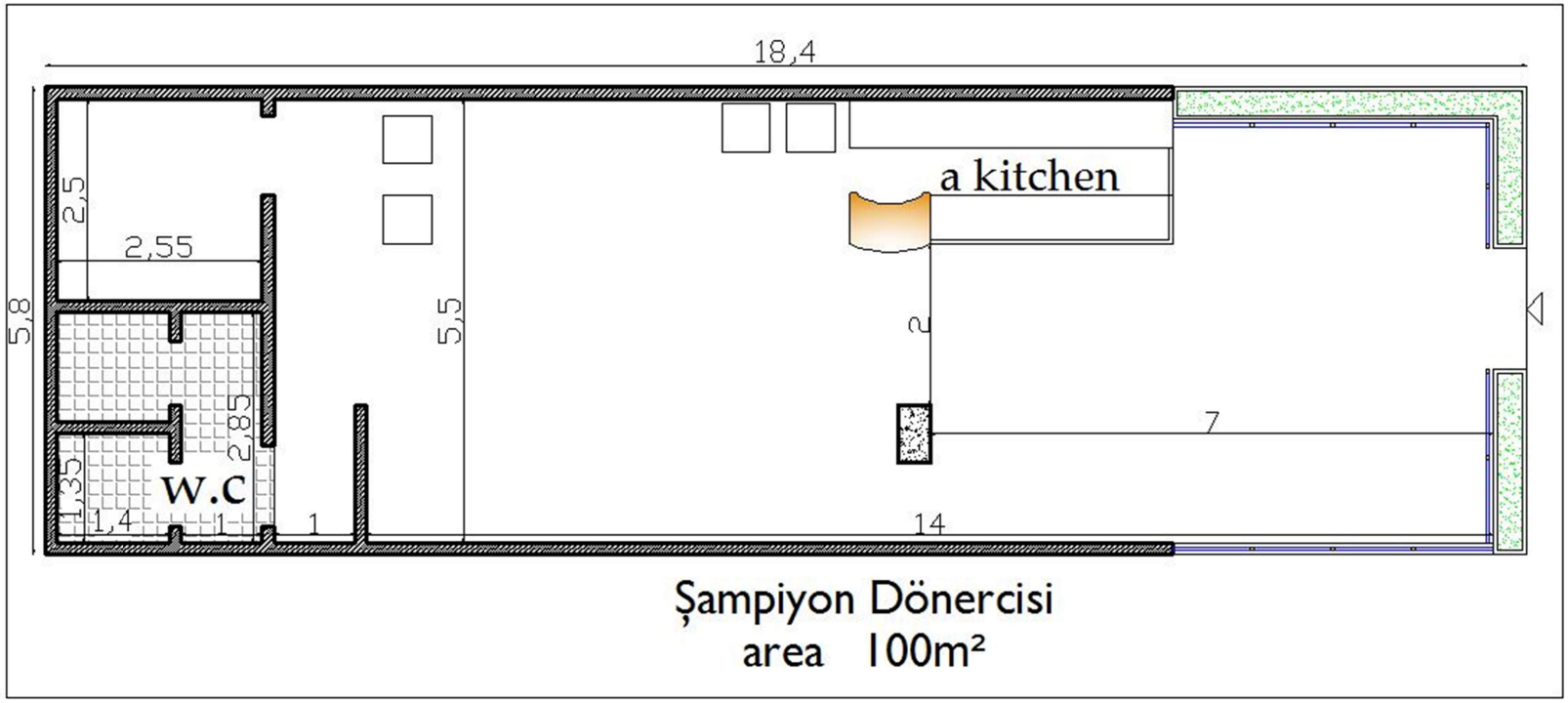
(RESTURANTS' PLANS)


3,2
1,7
3,2
W.C
2,5
1,4
1,5
2,7
13
15,2
9,6
4,6
a kitchen
3,2
4,6
4,2
Acar Pide & Kebap
area 195m²



Ciğerci Yakup
area 90m²


13,3
2,5
4
6,5
W.C
1,8
3,2
3,2
3
1,1
5,35
8
7
6,5
a kitchen
1,8
1,4
4,1
3,8
3,8
2,4
6,8
Hoşdere Kebap
area 120 m²



Şampiyon Dönercisi
area 100m²

APPENDIX C

(STATISTICAL ANALYSIS)

Table C1: One-Way ANOVA of User satisfaction differences based on gender (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Food taste	Between Groups	1,875	1	1,875	1,122	,292
	Within Groups	197,250	118	1,672		
	Total	199,125	119			
Portion size	Between Groups	2,700	1	2,700	1,856	,176
	Within Groups	171,667	118	1,455		
	Total	174,367	119			
Food representation	Between Groups	6,075	1	6,075	4,229	**,042**
	Within Groups	169,517	118	1,437		
	Total	175,592	119			
Utensils cleanness	Between Groups	,208	1	,208	,127	,722
	Within Groups	193,117	118	1,637		
	Total	193,325	119			
Food freshness	Between Groups	1,408	1	1,408	,964	,328
	Within Groups	172,383	118	1,461		
	Total	173,792	119			
Restaurant food variety	Between Groups	,075	1	,075	,046	,831
	Within Groups	192,917	118	1,635		
	Total	192,992	119			
Employees neatness	Between Groups	,133	1	,133	,084	,773
	Within Groups	187,567	118	1,590		
	Total	187,700	119			
Employees communication	Between Groups	,408	1	,408	,242	,624
	Within Groups	199,183	118	1,688		
	Total	199,592	119			
Service	Between Groups	,408	1	,408	,263	,609
	Within Groups	182,917	118	1,550		
	Total	183,325	119			
Price suitability with provided quality	Between Groups	,533	1	,533	,374	,542
	Within Groups	168,267	118	1,426		
	Total	168,800	119			
Product, service and price satisfaction	Between Groups	1,408	1	1,408	1,111	,294
	Within Groups	149,583	118	1,268		
	Total	150,992	119			
Physical Environment Satisfaction	Between Groups	4,800	1	4,800	3,061	,083
	Within Groups	185,067	118	1,568		
	Total	189,867	119			

Table C2: One-Way ANOVA of User satisfaction differences based on restaurant usage frequency (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Food taste	Between Groups	,630	3	,210	,123	,946
	Within Groups	198,495	116	1,711		
	Total	199,125	119			
Portion size	Between Groups	1,096	3	,365	,245	,865
	Within Groups	173,271	116	1,494		
	Total	174,367	119			
Food representation	Between Groups	1,324	3	,441	,294	,830
	Within Groups	174,268	116	1,502		
	Total	175,592	119			
Utensils cleanness	Between Groups	4,273	3	1,424	,874	,457
	Within Groups	189,052	116	1,630		
	Total	193,325	119			
Food freshness	Between Groups	5,036	3	1,679	1,154	,331
	Within Groups	168,755	116	1,455		
	Total	173,792	119			
Restaurant food variety	Between Groups	3,493	3	1,164	,713	,546
	Within Groups	189,498	116	1,634		
	Total	192,992	119			
Employees neatness	Between Groups	4,547	3	1,516	,960	,414
	Within Groups	183,153	116	1,579		
	Total	187,700	119			
Employees communication	Between Groups	2,220	3	,740	,435	,728
	Within Groups	197,371	116	1,701		
	Total	199,592	119			
Service	Between Groups	3,481	3	1,160	,748	,525
	Within Groups	179,844	116	1,550		
	Total	183,325	119			
Price suitability with provided quality	Between Groups	1,788	3	,596	,414	,743
	Within Groups	167,012	116	1,440		
	Total	168,800	119			
Product, service and price satisfaction	Between Groups	7,864	3	2,621	2,124	,101
	Within Groups	143,128	116	1,234		
	Total	150,992	119			
Physical Environment Satisfaction	Between Groups	7,974	3	2,658	1,695	,172
	Within Groups	181,892	116	1,568		
	Total	189,867	119			

Table C3: One-Way ANOVA of User satisfaction differences based on color brightness description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Food taste	Between Groups	77,414	6	12,902	11,979	**,000**
	Within Groups	121,711	113	1,077		
	Total	199,125	119			
Portion size	Between Groups	30,869	6	5,145	4,051	**,001**
	Within Groups	143,498	113	1,270		
	Total	174,367	119			
Food representation	Between Groups	40,459	6	6,743	5,639	**,000**
	Within Groups	135,132	113	1,196		
	Total	175,592	119			
Utensils cleanness	Between Groups	19,896	6	3,316	2,161	,052
	Within Groups	173,429	113	1,535		
	Total	193,325	119			
Food freshness	Between Groups	38,999	6	6,500	5,449	**,000**
	Within Groups	134,793	113	1,193		
	Total	173,792	119			
Restaurant food variety	Between Groups	21,391	6	3,565	2,348	**,036**
	Within Groups	171,601	113	1,519		
	Total	192,992	119			
Employees neatness	Between Groups	53,706	6	8,951	7,549	**,000**
	Within Groups	133,994	113	1,186		
	Total	187,700	119			
Employees communication	Between Groups	30,908	6	5,151	3,451	**,004**
	Within Groups	168,684	113	1,493		
	Total	199,592	119			
Service	Between Groups	55,600	6	9,267	8,198	**,000**
	Within Groups	127,725	113	1,130		
	Total	183,325	119			
Price suitability with provided quality	Between Groups	22,459	6	3,743	2,890	**,012**
	Within Groups	146,341	113	1,295		
	Total	168,800	119			
Product, service and price satisfaction	Between Groups	51,763	6	8,627	9,824	**,000**
	Within Groups	99,229	113	,878		
	Total	150,992	119			
Physical Environment Satisfaction	Between Groups	37,175	6	6,196	4,585	**,000**
	Within Groups	152,692	113	1,351		
	Total	189,867	119			

Table C4: One-Way ANOVA of User satisfaction differences based on color purity description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Food taste	Between Groups	32,898	5	6,580	4,512	**,001**
	Within Groups	166,227	114	1,458		
	Total	199,125	119			
Portion size	Between Groups	36,727	5	7,345	6,084	**,000**
	Within Groups	137,640	114	1,207		
	Total	174,367	119			
Food representation	Between Groups	42,791	5	8,558	7,347	**,000**
	Within Groups	132,801	114	1,165		
	Total	175,592	119			
Utensils cleanness	Between Groups	7,492	5	1,498	,919	,471
	Within Groups	185,833	114	1,630		
	Total	193,325	119			
Food freshness	Between Groups	38,674	5	7,735	6,526	**,000**
	Within Groups	135,117	114	1,185		
	Total	173,792	119			
Restaurant food variety	Between Groups	10,646	5	2,129	1,331	,256
	Within Groups	182,345	114	1,600		
	Total	192,992	119			
Employees neatness	Between Groups	32,511	5	6,502	4,776	**,001**
	Within Groups	155,189	114	1,361		
	Total	187,700	119			
Employees communication	Between Groups	25,883	5	5,177	3,397	**,007**
	Within Groups	173,709	114	1,524		
	Total	199,592	119			
Service	Between Groups	29,519	5	5,904	4,376	**,001**
	Within Groups	153,806	114	1,349		
	Total	183,325	119			
Price suitability with provided quality	Between Groups	23,798	5	4,760	3,742	**,004**
	Within Groups	145,002	114	1,272		
	Total	168,800	119			
Product, service and price satisfaction	Between Groups	47,573	5	9,515	10,488	**,000**
	Within Groups	103,419	114	,907		
	Total	150,992	119			
Physical Environment Satisfaction	Between Groups	35,927	5	7,185	5,321	**,000**
	Within Groups	153,939	114	1,350		
	Total	189,867	119			

Table C5: One-Way ANOVA of User satisfaction differences based on color reflection description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Food taste	Between Groups	30,894	6	5,149	3,459	**,004**
	Within Groups	168,231	113	1,489		
	Total	199,125	119			
Portion size	Between Groups	23,894	6	3,982	2,991	**,009**
	Within Groups	150,473	113	1,332		
	Total	174,367	119			
Food representation	Between Groups	53,259	6	8,877	8,199	**,000**
	Within Groups	122,333	113	1,083		
	Total	175,592	119			
Utensils cleanness	Between Groups	14,139	6	2,357	1,486	,189
	Within Groups	179,186	113	1,586		
	Total	193,325	119			
Food freshness	Between Groups	37,546	6	6,258	5,190	**,000**
	Within Groups	136,245	113	1,206		
	Total	173,792	119			
Restaurant food variety	Between Groups	25,891	6	4,315	2,918	**,011**
	Within Groups	167,100	113	1,479		
	Total	192,992	119			
Employees neatness	Between Groups	38,165	6	6,361	4,807	**,000**
	Within Groups	149,535	113	1,323		
	Total	187,700	119			
Employees communication	Between Groups	25,423	6	4,237	2,749	**,016**
	Within Groups	174,169	113	1,541		
	Total	199,592	119			
Service	Between Groups	49,544	6	8,257	6,975	**,000**
	Within Groups	133,781	113	1,184		
	Total	183,325	119			
Price suitability with provided quality	Between Groups	19,293	6	3,215	2,430	**,030**
	Within Groups	149,507	113	1,323		
	Total	168,800	119			
Product, service and price satisfaction	Between Groups	22,899	6	3,817	3,367	**,004**
	Within Groups	128,093	113	1,134		
	Total	150,992	119			
Physical Environment Satisfaction	Between Groups	68,019	6	11,336	10,513	**,000**
	Within Groups	121,848	113	1,078		
	Total	189,867	119			

Table C6: One-Way ANOVA of physical environment evaluation differences based on gender (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Aesthetics of the facility	Between Groups	7,500	1	7,500	3,649	,059
	Within Groups	242,500	118	2,055		
	Total	250,000	119			
Furniture cleanness	Between Groups	11,408	1	11,408	8,846	**,004**
	Within Groups	152,183	118	1,290		
	Total	163,592	119			
Colour attractiveness	Between Groups	3,008	1	3,008	1,966	,164
	Within Groups	180,583	118	1,530		
	Total	183,592	119			
Colour suitability for restaurant theme	Between Groups	4,800	1	4,800	3,271	,073
	Within Groups	173,167	118	1,468		
	Total	177,967	119			
Furniture quality	Between Groups	4,800	1	4,800	2,556	,113
	Within Groups	221,567	118	1,878		
	Total	226,367	119			
Painting and picture	Between Groups	6,533	1	6,533	4,072	**,046**
	Within Groups	189,333	118	1,605		
	Total	195,867	119			
Wall decorations attractiveness	Between Groups	,675	1	,675	,337	,563
	Within Groups	236,650	118	2,006		
	Total	237,325	119			
Restaurant Layout	Between Groups	1,008	1	1,008	,654	,420
	Within Groups	181,917	118	1,542		
	Total	182,925	119			
Space spaciousness	Between Groups	,133	1	,133	,072	,788
	Within Groups	217,067	118	1,840		
	Total	217,200	119			
Privacy level	Between Groups	,300	1	,300	,115	,735
	Within Groups	307,700	118	2,608		
	Total	308,000	119			
Size and shape of layout	Between Groups	1,875	1	1,875	,845	,360
	Within Groups	261,717	118	2,218		
	Total	263,592	119			
Comfortable movement around the restaurant	Between Groups	3,008	1	3,008	1,366	,245
	Within Groups	259,783	118	2,202		
	Total	262,792	119			

Table C6: One-Way ANOVA of physical environment evaluation differences based on gender (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Ambience	Between Groups	2,133	1	2,133	1,455	,230
	Within Groups	173,033	118	1,466		
	Total	175,167	119			
Temperature comfort	Between Groups	1,408	1	1,408	1,023	,314
	Within Groups	162,517	118	1,377		
	Total	163,925	119			
Pleasant scent	Between Groups	2,133	1	2,133	1,384	,242
	Within Groups	181,833	118	1,541		
	Total	183,967	119			
Background music	Between Groups	2,700	1	2,700	1,350	,248
	Within Groups	235,967	118	2,000		
	Total	238,667	119			
Noise level	Between Groups	,675	1	,675	,359	,550
	Within Groups	221,917	118	1,881		
	Total	222,592	119			
Table arrangement	Between Groups	8,533	1	8,533	5,574	**,020**
	Within Groups	180,633	118	1,531		
	Total	189,167	119			
Table covers	Between Groups	5,208	1	5,208	2,784	,098
	Within Groups	220,783	118	1,871		
	Total	225,992	119			
Lighting	Between Groups	5,208	1	5,208	3,061	,083
	Within Groups	200,783	118	1,702		
	Total	205,992	119			

Table C7: One-Way ANOVA of physical environment evaluation differences based on restaurant visit frequency (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Aesthetics of the facility	Between Groups	9,379	3	3,126	1,507	,216
	Within Groups	240,621	116	2,074		
	Total	250,000	119			
Furniture cleanness	Between Groups	2,471	3	,824	,593	,621
	Within Groups	161,121	116	1,389		
	Total	163,592	119			
Colour attractiveness	Between Groups	2,707	3	,902	,579	,630
	Within Groups	180,885	116	1,559		
	Total	183,592	119			
Colour suitability for restaurant theme	Between Groups	9,087	3	3,029	2,081	,107
	Within Groups	168,880	116	1,456		
	Total	177,967	119			
Furniture quality	Between Groups	5,435	3	1,812	,951	,418
	Within Groups	220,932	116	1,905		
	Total	226,367	119			
Painting and picture	Between Groups	3,058	3	1,019	,613	,608
	Within Groups	192,809	116	1,662		
	Total	195,867	119			
Wall decorations attractiveness	Between Groups	2,461	3	,820	,405	,750
	Within Groups	234,864	116	2,025		
	Total	237,325	119			
Restaurant Layout	Between Groups	5,401	3	1,800	1,176	,322
	Within Groups	177,524	116	1,530		
	Total	182,925	119			
Space spaciousness	Between Groups	,795	3	,265	,142	,935
	Within Groups	216,405	116	1,866		
	Total	217,200	119			
Privacy level	Between Groups	16,872	3	5,624	2,241	,087
	Within Groups	291,128	116	2,510		
	Total	308,000	119			
Size and shape of layout	Between Groups	2,488	3	,829	,368	,776
	Within Groups	261,104	116	2,251		
	Total	263,592	119			
Comfortable movement around the restaurant	Between Groups	4,533	3	1,511	,679	,567
	Within Groups	258,258	116	2,226		
	Total	262,792	119			

Table C7: One-Way ANOVA of physical environment evaluation differences based on restaurant visit frequency (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Ambience	Between Groups	3,858	3	1,286	,871	,458
	Within Groups	171,308	116	1,477		
	Total	175,167	119			
Temperature comfort	Between Groups	4,782	3	1,594	1,162	,327
	Within Groups	159,143	116	1,372		
	Total	163,925	119			
Pleasant scent	Between Groups	5,036	3	1,679	1,088	,357
	Within Groups	178,930	116	1,543		
	Total	183,967	119			
Background music	Between Groups	,641	3	,214	,104	,957
	Within Groups	238,026	116	2,052		
	Total	238,667	119			
Noise level	Between Groups	8,517	3	2,839	1,538	,208
	Within Groups	214,075	116	1,845		
	Total	222,592	119			
Table arrangement	Between Groups	6,519	3	2,173	1,380	,252
	Within Groups	182,648	116	1,575		
	Total	189,167	119			
Table covers	Between Groups	9,374	3	3,125	1,673	,177
	Within Groups	216,618	116	1,867		
	Total	225,992	119			
Lighting	Between Groups	1,826	3	,609	,346	,792
	Within Groups	204,166	116	1,760		
	Total	205,992	119			

Table C8: One-Way ANOVA of physical environment evaluation differences based on color brightness description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Aesthetics of the facility	Between Groups	84,042	6	14,007	9,537	**,000**
	Within Groups	165,958	113	1,469		
	Total	250,000	119			
Furniture cleanness	Between Groups	30,723	6	5,121	4,355	**,001**
	Within Groups	132,868	113	1,176		
	Total	163,592	119			
Colour attractiveness	Between Groups	30,079	6	5,013	3,690	**,002**
	Within Groups	153,513	113	1,359		
	Total	183,592	119			
Colour suitability for restaurant theme	Between Groups	31,140	6	5,190	3,994	**,001**
	Within Groups	146,826	113	1,299		
	Total	177,967	119			
Furniture quality	Between Groups	48,672	6	8,112	5,159	**,000**
	Within Groups	177,694	113	1,573		
	Total	226,367	119			
Painting and picture	Between Groups	40,598	6	6,766	4,924	**,000**
	Within Groups	155,268	113	1,374		
	Total	195,867	119			
Wall decorations attractiveness	Between Groups	52,554	6	8,759	5,357	**,000**
	Within Groups	184,771	113	1,635		
	Total	237,325	119			
Restaurant Layout	Between Groups	27,442	6	4,574	3,324	**,005**
	Within Groups	155,483	113	1,376		
	Total	182,925	119			
Space spaciousness	Between Groups	61,103	6	10,184	7,372	**,000**
	Within Groups	156,097	113	1,381		
	Total	217,200	119			
Privacy level	Between Groups	35,095	6	5,849	2,422	**,031**
	Within Groups	272,905	113	2,415		
	Total	308,000	119			
Size and shape of layout	Between Groups	63,808	6	10,635	6,015	**,000**
	Within Groups	199,784	113	1,768		
	Total	263,592	119			
Comfortable movement around the restaurant	Between Groups	49,450	6	8,242	4,365	**,001**
	Within Groups	213,342	113	1,888		
	Total	262,792	119			
Ambience	Between Groups	38,211	6	6,368	5,254	**,000**

Table C8: One-Way ANOVA of physical environment evaluation differences based on color brightness description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	136,956	113	1,212		
	Total	175,167	119			
Temperature comfort	Between Groups	28,622	6	4,770	3,984	**,001**
	Within Groups	135,303	113	1,197		
	Total	163,925	119			
Pleasant scent	Between Groups	38,827	6	6,471	5,038	**,000**
	Within Groups	145,140	113	1,284		
	Total	183,967	119			
Background music	Between Groups	41,141	6	6,857	3,923	**,001**
	Within Groups	197,525	113	1,748		
	Total	238,667	119			
Noise level	Between Groups	37,176	6	6,196	3,776	**,002**
	Within Groups	185,416	113	1,641		
	Total	222,592	119			
Table arrangement	Between Groups	53,985	6	8,997	7,521	**,000**
	Within Groups	135,182	113	1,196		
	Total	189,167	119			
Table covers	Between Groups	23,265	6	3,878	2,161	,052
	Within Groups	202,727	113	1,794		
	Total	225,992	119			
Lighting	Between Groups	49,093	6	8,182	5,893	**,000**
	Within Groups	156,898	113	1,388		
	Total	205,992	119			

Table C9: One-Way ANOVA of physical environment evaluation differences based on color purity description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Aesthetics of the facility	Between Groups	71,635	5	14,327	9,157	**,000**
	Within Groups	178,365	114	1,565		
	Total	250,000	119			
Furniture cleanness	Between Groups	26,825	5	5,365	4,472	**,001**
	Within Groups	136,767	114	1,200		
	Total	163,592	119			
Colour attractiveness	Between Groups	28,344	5	5,669	4,163	**,002**
	Within Groups	155,248	114	1,362		
	Total	183,592	119			
Colour suitability for restaurant theme	Between Groups	28,969	5	5,794	4,433	**,001**
	Within Groups	148,998	114	1,307		
	Total	177,967	119			
Furniture quality	Between Groups	30,752	5	6,150	3,584	**,005**
	Within Groups	195,615	114	1,716		
	Total	226,367	119			
Painting and picture	Between Groups	42,595	5	8,519	6,336	**,000**
	Within Groups	153,272	114	1,344		
	Total	195,867	119			
Wall decorations attractiveness	Between Groups	31,700	5	6,340	3,515	**,005**
	Within Groups	205,625	114	1,804		
	Total	237,325	119			
Restaurant Layout	Between Groups	52,955	5	10,591	9,290	**,000**
	Within Groups	129,970	114	1,140		
	Total	182,925	119			
Space spaciousness	Between Groups	28,780	5	5,756	3,483	**,006**
	Within Groups	188,420	114	1,653		
	Total	217,200	119			
Privacy level	Between Groups	33,763	5	6,753	2,807	**,020**
	Within Groups	274,237	114	2,406		
	Total	308,000	119			
Size and shape of layout	Between Groups	109,629	5	21,926	16,235	**,000**
	Within Groups	153,963	114	1,351		
	Total	263,592	119			
Comfortable movement around the restaurant	Between Groups	51,963	5	10,393	5,620	**,000**
	Within Groups	210,828	114	1,849		
	Total	262,792	119			
Ambience	Between Groups	57,209	5	11,442	11,058	**,000**

Table C9: One-Way ANOVA of physical environment evaluation differences based on color purity description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Temperature comfort	Within Groups	117,958	114	1,035		
	Total	175,167	119			
	Between Groups	37,433	5	7,487	6,747	**,000**
	Within Groups	126,492	114	1,110		
	Total	163,925	119			
Pleasant scent	Between Groups	26,416	5	5,283	3,823	**,003**
	Within Groups	157,550	114	1,382		
	Total	183,967	119			
Background music	Between Groups	45,740	5	9,148	5,406	**,000**
	Within Groups	192,927	114	1,692		
	Total	238,667	119			
Noise level	Between Groups	31,270	5	6,254	3,727	**,004**
	Within Groups	191,322	114	1,678		
	Total	222,592	119			
Table arrangement	Between Groups	31,864	5	6,373	4,619	**,001**
	Within Groups	157,302	114	1,380		
	Total	189,167	119			
Table covers	Between Groups	19,037	5	3,807	2,097	,071
	Within Groups	206,955	114	1,815		
	Total	225,992	119			
Lighting	Between Groups	30,981	5	6,196	4,036	**,002**
	Within Groups	175,011	114	1,535		
	Total	205,992	119			

Table C10: One-Way ANOVA of physical environment evaluation differences based on color reflection description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Aesthetics of the facility	Between Groups	31,675	6	5,279	2,732	**,016**
	Within Groups	218,325	113	1,932		
	Total	250,000	119			
Furniture cleanness	Between Groups	28,486	6	4,748	3,971	**,001**
	Within Groups	135,106	113	1,196		
	Total	163,592	119			
Colour attractiveness	Between Groups	50,871	6	8,479	7,219	**,000**
	Within Groups	132,720	113	1,175		
	Total	183,592	119			
Colour suitability for restaurant theme	Between Groups	33,171	6	5,528	4,314	**,001**
	Within Groups	144,796	113	1,281		
	Total	177,967	119			
Furniture quality	Between Groups	46,556	6	7,759	4,876	**,000**
	Within Groups	179,811	113	1,591		
	Total	226,367	119			
Painting and picture	Between Groups	47,421	6	7,903	6,016	**,000**
	Within Groups	148,446	113	1,314		
	Total	195,867	119			
Wall decorations attractiveness	Between Groups	46,466	6	7,744	4,585	**,000**
	Within Groups	190,859	113	1,689		
	Total	237,325	119			
Restaurant Layout	Between Groups	44,738	6	7,456	6,097	**,000**
	Within Groups	138,187	113	1,223		
	Total	182,925	119			
Space spaciousness	Between Groups	62,292	6	10,382	7,573	**,000**
	Within Groups	154,908	113	1,371		
	Total	217,200	119			
Privacy level	Between Groups	51,298	6	8,550	3,764	**,002**
	Within Groups	256,702	113	2,272		
	Total	308,000	119			
Size and shape of layout	Between Groups	82,055	6	13,676	8,513	**,000**
	Within Groups	181,536	113	1,607		
	Total	263,592	119			
Comfortable movement around the restaurant	Between Groups	60,171	6	10,029	5,593	**,000**
	Within Groups	202,621	113	1,793		
	Total	262,792	119			
Ambience	Between Groups	29,870	6	4,978	3,872	**,001**

Table C10: One-Way ANOVA of physical environment evaluation differences based on color reflection description (p<,05)

		Sum of Squares	df	Mean Square	F	Sig.
Temperature comfort	Within Groups	145,297	113	1,286		
	Total	175,167	119			
	Between Groups	32,921	6	5,487	4,733	**,000**
	Within Groups	131,004	113	1,159		
	Total	163,925	119			
Pleasant scent	Between Groups	25,664	6	4,277	3,053	**,008**
	Within Groups	158,303	113	1,401		
	Total	183,967	119			
Background music	Between Groups	47,506	6	7,918	4,680	**,000**
	Within Groups	191,160	113	1,692		
	Total	238,667	119			
Noise level	Between Groups	24,245	6	4,041	2,302	**,039**
	Within Groups	198,347	113	1,755		
	Total	222,592	119			
Table arrangement	Between Groups	57,174	6	9,529	8,158	**,000**
	Within Groups	131,992	113	1,168		
	Total	189,167	119			
Table covers	Between Groups	17,115	6	2,853	1,543	,171
	Within Groups	208,877	113	1,848		
	Total	225,992	119			
Lighting	Between Groups	72,480	6	12,080	10,224	**,000**
	Within Groups	133,511	113	1,182		
	Total	205,992	119			