COLOR, EMOTION AND BEHAVIORAL INTENTIONS IN CITY HOTEL GUESTROOMS

A Master's Thesis

by

SELİN YAR

The Department Of

Interior Architecture and Environmental Design

İhsan Doğramacı Bilkent University

Ankara

June 2016

To my wonderful parents; Mete Yar and Ayşe Yar

&

my precious sister Pelin Yar

COLOR, EMOTION AND BEHAVIORAL INTENTIONS IN CITY HOTEL GUESTROOMS

Graduate School of Economics and Social Sciences

of

İhsan Doğramacı Bilkent University

by

SELİN YAR

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in

THE DEPARTMENT OF

INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN

İHSAN DOĞRAMACI BİLKENT UNIVERSITY

ANKARA

June 2016

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Fine Arts in Interior Architecture and Environmental Design.

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Assoc. Prof. Dr. Nilgün Olguntürk

Supervisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Fine Arts in Interior Architecture and Environmental Design.

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ABSTRACT

COLOR, EMOTION AND BEHAVIORAL INTENTION IN CITY HOTEL GUESTROOMS

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The aim of this study is to explore the effect of colors on people's emotional states and behavioral intentions in a real world city hotel guestroom. The conceptual framework of the study is based on the Mehrabian- Russell model that suggests that an environmental stimulus from physical environments would create an emotional state which would then elicit behavioral intentions. A field study approach is used and conducted with three different sample groups for three different colors which are blue, yellow and grey. The study is carried out in two phases. This experimental procedure is repeated for each color scheme in the same hotel guestroom with different participants. The results indicate that blue and yellow are associated with pleasure and arousal, whereas grey color evokes displeasure and no arousal. Moreover, yellow and blue are found to reveal approach behavior, while the color grey is found to evoke avoidance behavior in city

hotel guestrooms. In addition to these, it is shown that there is a positive relationship between pleasure and approach behavior and between arousal and approach behavior. The results of this study can be useful for interior architects, designers and hoteliers who put emphasis on touching guests' emotions and behavioral intentions to meet guest expectations, enhance hotelier's satisfaction and guest's loyalty.

Keywords: Behavioral Intentions; Colors; City Hotel Guestrooms; Emotions; Mehrabian – Russell Model.

ÖZET

ŞEHİRİÇİ OTEL ODALARINDA RENK, DUYGU VE DAVRANIŞ EĞİLİMİ

Yar, Selin

İç Mimarlık ve Çevre Tasarımı Yüksek Lisans Programı

Danışman: Doç. Dr. Nilgün Olguntürk

Haziran 2016

Bu çalışmanın amacı şehir içi otel odalarında rengin insanların duygu ve davranış eğilimine etkisini araştırmaktır. Araştırmanın kavramsal çerçevesinde Mehrabian-Russell modeli temel alınmıştır. Bu model, fiziksel çevreden gelen fiziksel uyarıcının bir duygu yaratacağını ve bu duygunun bir davranış eğilimine sebep olacağı önermesine dayanır. Alan çalışması yaklaşımıyla, üç farklı renk şeması (mavi, yeşil ve gri) için üç farklı denek grubuyla bu çalışma gerçekleştirilmiştir. Çalışma iki aşamada yürütülmüştür. Bu deneysel prosedür farklı katılımcılarla aynı otel odasında her renk düzeni için tekrarlanmıştır. Sonuçlar sarı ve mavi rengin memnuniyet ve uyarılma ile ilgisi olduğunu gösterirken, gri rengin hiçbir uyarılmaya neden olmadığını ve

hoşnutsuzluk yarattığını göstermektedir. Ayrıca gri rengin kaçınma davranışı, sarı ve mavi rengin ise yaklaşım davranışına sebep olduğu bulunmuştur. Bunlara ek olarak, memnuniyet ve yaklaşım davranışı ile uyarılma ve yaklaşım davranışı arasında pozitif bir ilişki olduğu gösterilmiştir. Bu çalışmanın sonuçları, konukların duygu ve davranış eğilimlerine önem vermesi, konukların beklentilerinin karşılanması, otelcilerin memnuniyetini ve müşteri sadakatini arttırması açısından iç mimarlar, tasarımcılar ve otelciler için yararlı olabilir.

Anahtar Kelimeler: Davranış Eğilimleri; Duygular; Kent Merkezi Otel Odaları; Mehrabian – Russell Modeli; Renkler.

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CHAPTER I

INTRODUCTION

Over the years, the significance of the environmental stimuli in affecting people emotions and behaviors has been investigated in many behavior studies all over the world in different settings such as restaurants, upscale hotels, retail stores, and gambling establishments (Donovan & Rossitter, 1982; Finlay et. al., 2006; Lin & Mattila, 2010; Matilla & Wirtz, 2001; Ryu & Jang, 2007; Spies et. al., 1997; Wall & Berry, 2007). By the reason of enhancing global market competition, many hotel companies are facing difficulties in terms of retaining guests. By raising satisfaction or quality standards, hospitality managers begin to focus on touching guests' emotions and behavioral intentions in terms of loyalty to improve their profits and return to purchase (Ganesh et. al., 2000). Customer loyalty intention and touching guests' emotions are thought as major prerequisite for the future survival of organizations (Kandampully & Suhartanto, 2000). However, hospitality researchers have paid limited attention to comprehending how the environmental stimuli affect guests' emotion and behavior in hospitality industry, particularly in hotel guestroom context.

Recent studies indicate that hotel guestrooms are the most important spaces to create positive feelings on guests and induce behavior intentions in terms of loyalty (DeVeau

et. al., 1996; Doswell & Gamble, 1979; Hotel Online, 2000; Jusko, 1991; Rutes et. al., 2001; Loethr, 2001; Walker, 2002). According to marketing manager of the Peninsula Group (Hong Kong), guestrooms in hotels play a central role in what hotels are all about (Walker, 2002). Jusko (1991) support that no matter how lavish the lobby or restaurant; guestrooms are the most important places to retain customers and are the most influential spaces for customer in terms of affecting their emotions in different ways (Doswell & Gamble, 1979). Rutes et al. (2001) and Loethr (2001) and highlight that many hotel operators believe guestrooms with bathrooms provide a more lasting effect on their guests than exterior spaces or lobby or any other single space in the hotel. DeVeau et al. (1996) support that no matter the type of hotel, the most significant state of it in the minds of the guests are the guestrooms and bathrooms. According to Hotel Online (2000), the guests' satisfaction is directly related with guestroom experience, the accommodation element of the stay. This is supported by a study of hotel guests in different market segments where it is indicated that the guestrooms contribute to most important effect on guests compared to other factors such as pre-arrival and arrival opinion, departure regulations, hotel services and food & beverage (Hotel Online, 2000).

In addition to these, according to Jones and Lockwood (1989), guestrooms are the part of hotel in which guests generally spend most of their stay so the decoration and design has a significant effect on guests' emotion and pleasantness of that stay. Moreover, architecture, décor and furnishing of the guestrooms are keys to satisfaction of guest, creating positive emotions and prime consideration for return patronage (Nobles, 1999). Siguaw and Enz (1999) also pursue that design elements in the guestrooms such as furniture, color and lighting may aid to create an environment for guests to rest and

relax. Therefore, hotel designers should comprehend the function and design of the hotel room to meet guests' needs to relax and rest. Moreover, Ogle (2009) shows that visual aspects such as décor, color, lighting in the guestroom are the most influential factor to effect guests. In terms of loyalty intention and creation of positive emotions of the customer, previous studies also show that visual elements like color are the most dominant sense (Special Sense Organs, 2002). This is supported by the view that we live in visually oriented world in which the great majority of our attention is set sight on what we can see (Suzuki, 2002). However, many past studies related with visual elements have been conducted by showing photos, using color chips instead of using a real environment (Nurlelawati et. al., 2012; Park & Park, 2013).

City hotels are located in urban areas, usually reserved for people whose aim is to stay for a short term and it is generally preferred by business guests who benefit from the facilities and business services provided by the hotel (Tarmoezi, 2000). According to Levere (2003), business guests, who generally stay in city hotels, increasingly spend more time in their room because of both work and relaxation. Obata (2001) propose that hotel rooms come in possession of the second homes for many business guests. Moreover, according to McDonough et al. (2001), hotel rooms are in the business memories and hotel owners, architects or interior designers should take into consideration to provide a good memory for business guests.

1.1. Aim of the Study

According to all reasons mentioned above, the current study contributes to fill this gap

by evaluating the influence of color on guests' emotional states and behavioral intentions in the hotel setting, particularly in a real world city hotel guestroom context. In other words, the main purpose of the study is to understand the effect of colors on guests' emotional states and behavioral intentions in city hotel guestrooms. Besides that purpose of this study is to explore the relationship between the guests' emotional states and behavioral intentions in city hotel guestrooms.

1.2. General Structure of the Thesis

This thesis comprises of six chapters. The first chapter is the introduction, the importance of guests' emotional states and behavioral intentions for hotels and the importance of visual elements in hotels are briefly indicated. In addition, the aim of the study and the general structure of the thesis are clarified in this chapter.

The second chapter is about the background of color studies. Firstly, in order to comprehend the color stimuli, basic terms of color are briefly explained. Secondly, color order systems are clarified to give information about how color order systems are used. In addition to these, the discussions related to past color studies are explored. The effects of colors on emotional states and behavioral intentions are stated and past studies on these subjects are explained. Lastly, color design in hotel rooms are explained to understand how color could be used in hotel rooms.

The third chapter is related to emotional states and behavioral intentions model. In this part, firstly the working principle of Mehrabian- Russell's (1974) model is briefly

explained. Environmental stimuli, emotional states and behavioral intentions are considered in detail. Lastly, the parts of the study grounding on the M-R model are explained to provide an understanding of the effects of colors on emotional states and behavioral intentions in real world city hotel guestroom context.

Fourth chapter is the experiment part related to the aim and the method of the study. The aim of the study is identified with research questions and hypotheses of the study. The method of the experiment is explained with the identification of the sample group, the description of the instrument and the statement of the phases of the experiment. In the phases of the experiment part, how experiment hotel room is selected, how color and color alterations are specified, the experiment setting and the procedure of the experiment are explained in detail.

The fifth chapter is the findings chapter. Findings related to demographic information, the statistical analysis and evaluation of the data acquired from the experiment are explained. In addition, the findings are discussed and compared with previous studies' results in the literature.

In the sixth chapter, conclusions about the study are indicated. Moreover, limitations and suggestions for further researches are given.

CHAPTER II

BACKGROUND OF COLOR

2.1. Basics

Three attributes that are hue, saturation and brightness are sufficient in order to define the quality and characteristics of color. These features are also acknowledged as dimensions of color as they might be independently measured (Fehrman & Fehrman, 2000; Gosney & Dayton, 1995; Munsell, 1988). It is attainable to alter one quality without varying the other dimensions. It means that without altering the brightness or saturation, hue might be changed; without altering hue and brightness rate, a color might be increased or diminished in saturation; without effecting the saturation or hue, the brightness may be altered (Munsell, 1988).

The quality and characteristics by the way of one color is differentiated from another is associated with *hue* (see Figure 1). It enables to distinguish one color from another as red from yellow or green from blue (Fehrman & Fehrman, 2000). Hue is specified by wavelength and symbolizes the chromatic aspect (Mahnke & Mahnke, 1987). Concerning their hue content, colors are split into two parts as achromatic and chromatic colors. *Achromatic colors* are black, white and grey to show regard to be colors without

hue (Mahnke & Mahnke, 1987; Raskin, 1986). *Chromatic colors* are the ones other than black, white and grey. Regarding their positions on the spectrum and the perception of the viewers, colors are differentiated as warm and cool. *Cool colors*, which are green, yellow and violet, are the ones near the violet end of the spectrum, although *warm colors*, which are red, orange and yellow, are the ones near the red end of the spectrum. Violet might be comprehended as warm or cool belonging to its red or blue content (Pile, 1997).

The second attribute by the way of differentiating one color is *saturation (chroma)*. It specifies the purity of a given color, the quality that differentiates it from a grayed one (Fehrman & Fehrman, 2000) (see Figure 1). It means that two colors may be the same in hue like two reds and one no lighter or darker than the other, yet still seem to be different in color strength (Mahnke & Mahnke, 1987).

The third attribute in describing a color is *brightness (value or lightness)*. It is a luminous sensation or light source intensity when identifying the light and is highly saturated when identifying color (Mahnke & Mahnke, 1987) (see Figure 1). It is related to the total amount of light energy present in that color (Fehrman & Fehrman, 2000) and it allows distinguishing a dark color from a light one (Mahnke & Mahnke, 1987; Munsell, 1988).

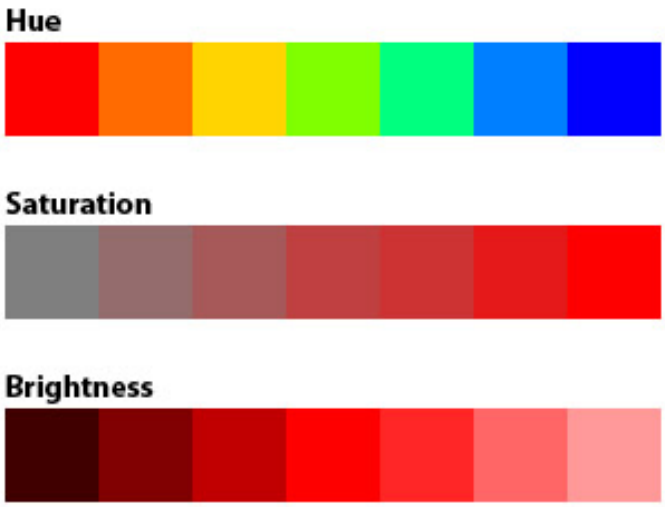

Figure 1. Hue, saturation and brightness.
(http://www.snap2objects.com/2009/03/color-theory-101/)

2.2. Color Order Systems

The eye of humans can comprehend ten million colors (Fehrman & Fehrman, 2000). Color order systems are enhanced to differentiate colors from each other. RGB, CIELAB, Munsell Color System and National Color System are commonly used color order systems in various research areas. Each color system has their own rightness to systemize colors in a different manner (Holtzchue, 2006). However, the main aim of all color order systems is to identify the dimensions of colors (hue, saturation and brightness), and to differentiate colors in a systematic manner (Fehrman & Fehrman, 2000; Holtzchue, 2006).

2.2.1. CIE Color Space

CIE Color Space is very widely used in growing software programs about the usage of color. CIELUV and CIELAB are the subsequent versions of CIE Color Space, which are grown to enable a unifying color space. It is depended on a system in which relative amounts of primary colors (red, green, blue) are mixed to describe and indicate any color (Agoston, 1987). However, in everyday use, it is not practical as other systems comprised of patches or color chips which a sample can be visually paired. CIE identifications are showed in mathematical form thus, it is required to mention color samples intensify from coordinates (Mahnke & Mahnke, 1987).

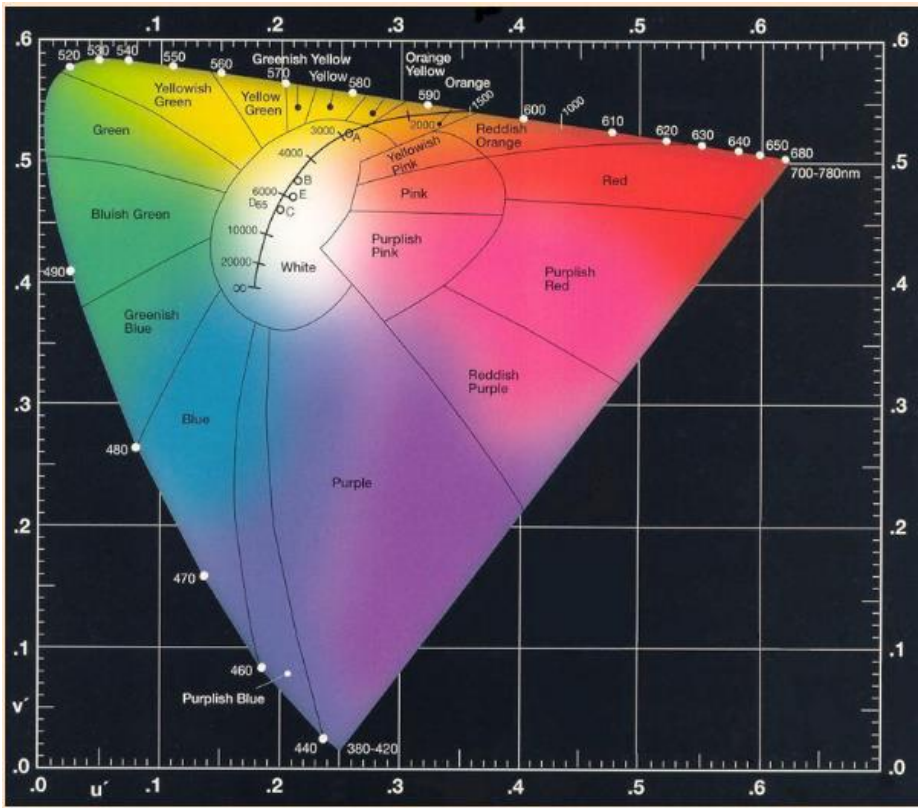

Figure 2. CIE color diagram.
(http://hyperphysics.phy-astr.gsu.edu/hbase/vision/cie1976.html#c1)

2.2.2. RGB

RGB color model is an additive color model based on creating colors by mixing various proportion of colored light. White light comes from the basic colors, red, green and blue, which are known as the additive or spectral, primary colors (Ladau et al., 1988; Raskin, 1986). Primary colors are pure colors (hues) from which theoretically all other colors can be mixed and which themselves cannot be created by a mixture of other colors (Ladau et. al., 1988). Mixing the red, green and blue light not only constitute a white or colorless light but also by differentiating the intensities of colors almost another color can be formed (Helen, 1983). In addition to this, secondary colors are hues resulting from the mixing of a primary hue and an adjacent primary hue. When the two components come together with equal intensity, the hue of secondary colors is formed: magenta is the mixture of red and blue, yellow is the mixture of red and green and cyan is the mixture of green and blue (Feisner, 2006) (see Figure 3).

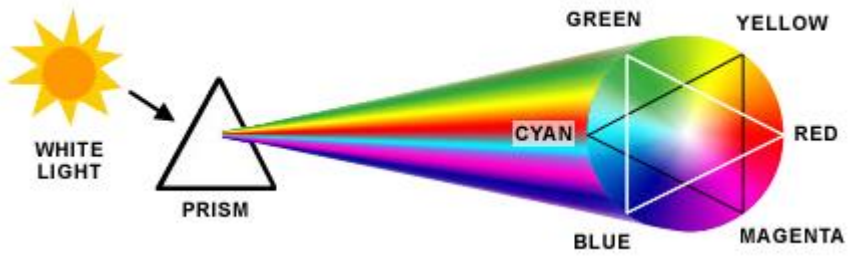

Figure 3. RGB chromaticity chart.
(http://www.colormatters.com/color-and-design/color-systems-rgb-and-c)

In RGB color model, there are also tertiary colors instead of primary and secondary colors. Tertiary colors are formed by the mixtures of a primary and secondary colors.

Therefore, orange, yellow-green, cyan-green, cyan-blue, blue-magenta and red-magenta are the tertiary colors. In RGB color circle, these hues are organized with 12 steps (see Figure 4). There are degrees around the RGB color wheel, starting from the top being 0˚ (red) and arranged in clockwise being 360˚. Each degree identifies a particular color.

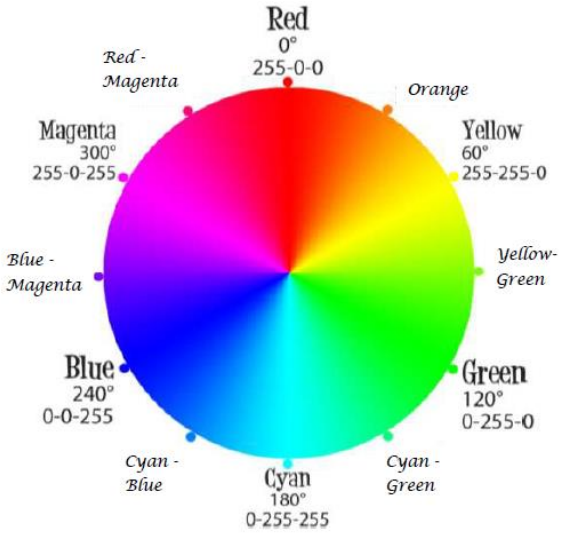

Figure 4. RGB colour wheel.

(http://www.colormatters.com/color-and-design/color-systems-rgb-and-c)

2.2.3. Munsell Color System

One of the most widely used color order systems is the Munsell system, which is developed by A. H. Munsell in 1905. It describes surface colors with regards to three dimensions of color; hue, value and chroma (Agoston, 1987; Fehrman & Fehrman, 2000). There are ten major hues in the circle of the Munsell system that is arranged clockwise around the color wheel by name (Agoston, 1987; see Figure 5). It is depended on five principal hues, which are red (R), yellow (Y), green (G), blue (B), and purple (P)

and is based on five intermediate hues which are yellow-red (YR), green-yellow (GY), blue-green (BG), purple-blue (PB), and red-purple (RP) (Hunt, 1987). Each denoted hue is subdivided further into four sections and organized 2.5, 5, 7.5, and 10, pursued by its hue initial (2.5R, 5R,7.5R,10R). These are demonstrated in the inner circle of the color wheel and might be utilized for rough specification of hue. Each denominated color is also split into ten sections named by the numerals 1 to 100 and demonstrated on the outer circle of the color wheel (Mahnke & Mahnke, 1987).

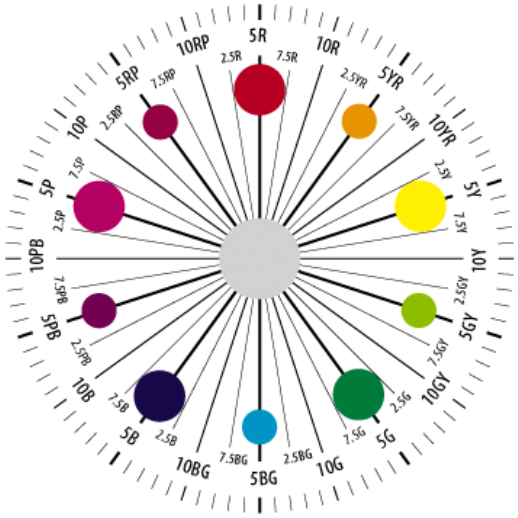

Figure 5. Munsell hue circle.
(http://munsell.com/)

The Value (V) (brightness) character is identified on a scale from 0 to 10 and mentions to the brightness of comprehended color much as the luminance effect (Agoston, 1987). It consists of ten main steps, with white specified 10 and black 0, grays from 1 to 9 as they start to be lighter (Hunt, 1987). Therefore, it demonstrates the darkness or lightness of a color respecting neutral grey scale. The symbol 0/ identifies certain black, although

10/ identifies certain white. The symbol 5/ shows middle gray (Munsell Colour Corporation, 1980). These symbols are utilized for all chromatic colors that are seen halfway in value between certain white and certain black (see Figure 6). The Munsell value of a sample among other samples is organized through using decimals (Hunt, 1987). It means that a value of 7.5 would be expected brightness to perceptually be between in samples owing to values of 7 and 8.

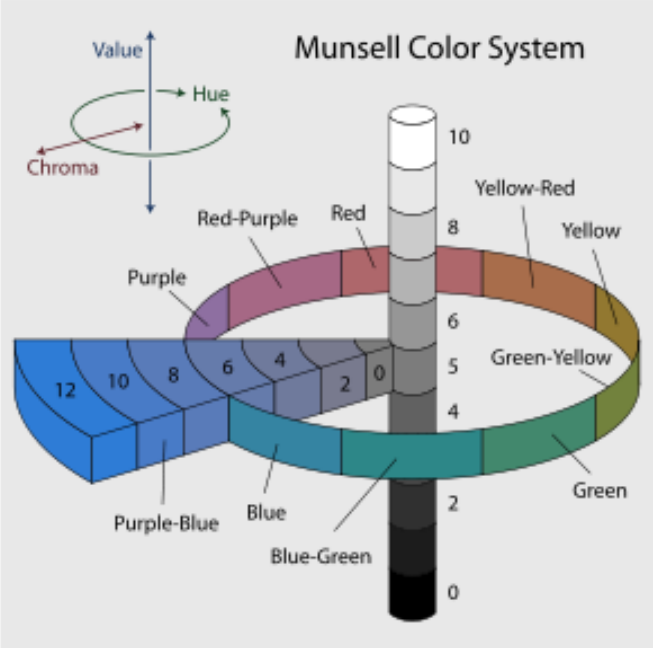

Figure 6. Hue, value and chroma scales organized in color space. (http://munsell.com/color-blog/time-for-a-munsell-revival/)

The Chroma (C) (saturation) character is showed regard to be the comprehended saturation and identified with its variation from neutral gray of the same value (Agoston, 1987). The symbol /0 shows neutral grey out of /10, /12, /14 or further (Munsell Color Corporation, 1980). It is calculated together with a hue-radius that refer that the chroma

is zero at the center (neutral gray) and enhance outward to be a maximum chroma (Agoston, 1987).

It demonstrates approximately 150 color standards organized in slots on charts for forty different hues (Munsell Colour Corporation, 1980). The Munsell hue chips are organized to demonstrate differentiations of Munsell system chroma horizontally and Munsell system value vertically (Agoston, 1987; Hunt, 1987) (see Figure 7). The system is used in various applications such as statistical records, cataloging, and computer programming through its simple use. It provides users to decide the characteristics of color without experimentation and enable to identification about the pigment of color (Hunt, 1987; Mahnke & Mahnke, 1987).

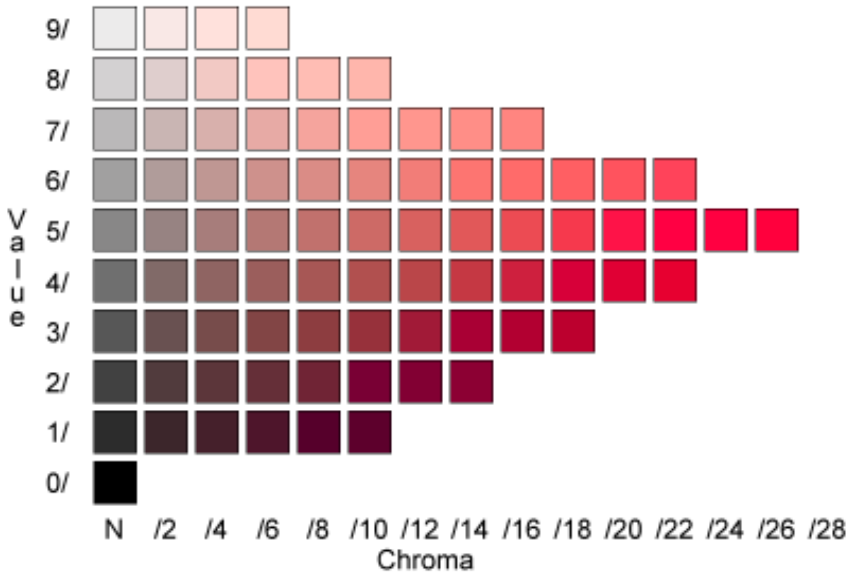

Figure 7. Example page from Munsell Book of Colour. (http://munsell.com/color-products/color-standards/munsell-color-coding)

2.2.4. National Color System (NCS)

NCS is produced by the Swedish physicist Tryggue Johansson (Agoston, 1987; Hunt, 1987). It lets users with normal color vision to understand color without using measuring instruments of color or color samples to compare colors (Agoston, 1987). It identifies the formal main characteristics of color language and enables sufficiency to describe the relations, similarities or differences between the colors (Hard & Sivik, 2001). It is directly used to decide on the comprehended surface color. A color is decided by depending on color perception.

NCS is the acknowledgement of six psychological primaries: yellow, red, blue, green, white and black (Agoston, 1987; Fehrman & Fehrman, 2000; Judd & Wyszecki, 1975). Deciding on color hues by the NSC is the first step to understand a color. The binary compositions of hues Y, R, B, and G, are systematically arranged in NCS color circle (see Figure 8). The NCS hue circle is separated into four quadrants (Y/R, R/B, B/G, and G/Y) through connective hues that are Y, R, B, G. The standard NSC hue presentations are read in clockwise around the color wheel (Agoston, 1987). The dashed lines divide hue ranges. It means that the hues in between Y50R and R50B are the reds; the hues in between R50B and B50G are the blues and continuing in the same way around the color wheel. In this terminology with yellowish reds and bluish reds are used as common hue terms instead of orange and purple (Agoston, 1987).

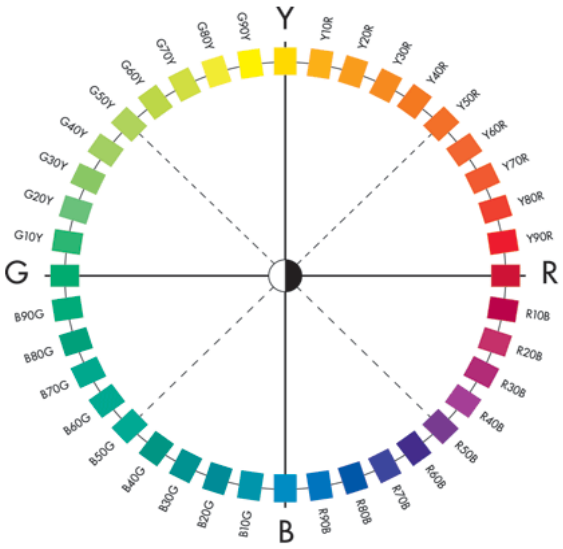

Figure 8. NCS color circle.
(http://www.ncscolour.com/en/natural-colour-system/logic-behind-the-system/)

Colors are described by the relative amounts of the basic colors, which are comprehended and showed by percentages (Hunt, 1987). It means that a medium grey which comprises of same amounts of blackness and whiteness is identified as having a blackness of 50% and a whiteness of 50%. A pure blue color with no note of redness or greenness or blackness or whiteness is described as having blueness 100%. Thus, the mark of B50G in the NCS color circle expresses a 50/50 mixture of unitary blue and unitary green as G50Y, Y50R, and R50B expresses 50/50 mixtures (Agoston, 1987).

Two unitary hues and the quadrant of the color circle where the location of hue is required to be described in order to assess color hue (Hunt, 1987). It means that for the mixture of blue and green, the location is B/G quadrant. If the hue has 30% unitary blue and 70% unitary green, the mark of this hue is B70G. This mark symbolizes the

chromatic component of C. If the relative amounts of blackness (S) 40% and 50% chromaticness (C), its NCS indication is S4050-B70. In the hue triangle, by the relative amounts of S, W, and C, the comprehended color can be exemplified (see Figure 9).

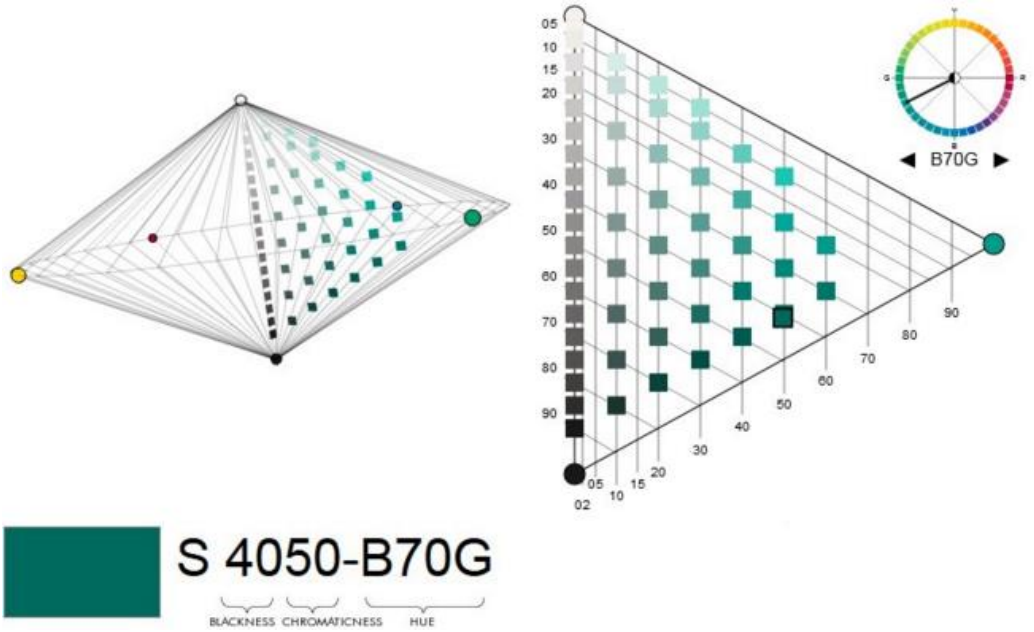

Figure 9. One NCS identification and one NCS hue triangles. (http://www.ncscolour.com/en/design-architecture/work-digitally-with-ncs/ncs-navigator/)

The NCS color atlas consists of 1750 color samples and 42 pages. The first page demonstrates the NCS color circle with 40 color samples of high chromaticness (saturation), demonstrating the hues chosen for the atlas (see Figure 9). The second page of the atlas contains color samples for slightly-chromatic (near-grey) and non-chromatic (purely grey) colors. The other 40 pages contain NCS triangles that demonstrate various hues and connections to black and white of a particular hue in each page (Swedish Standards Institution, 1996) (see Figure 9).

NCS can be used by people with no specific information about color and with no past experience on color identification or measurement (Agoston, 1987). It is the only color system used in the psychology field; all the descriptions are directly connected to the characteristics of color comprehensions (Tonnquist, 1988). The mark is easily comprehended when contrasted with the other systems. It is produced with the aim of helping colorists, manufacturers and other users of different kinds of colored products to get in touch about color in the characteristics of color comprehensions (Swedish Standards Institution, 1996).

2.3. Review of Color Studies

Over the years, many studies have been performed with respect to the influence of color on physiology, psychology and emotion. In terms of the chroma context, cool and warm colors were used to see the biggest differences between the effects of color. Since, warms colors (red and yellow) have produced opposite physiological, psychological and emotional effects to cool colors (blue and green), which are opposite on the color spectrum. Blue as a cool color and red as a warm color were the most preferred colors in the studies to show these differences (Bellizzi & Hite, 1992; Camgöz et. al., 2002; Clynes, 1977; Elliot et. al., 2007; Gerard, 1957; Gerend & Sias, 2009; Hulbert & Ling, 2007; Manav, 2007; Nakshian, 1964; Pastoureau, 2001; Valdez & Mehrabian, 1994; Wogalter et. al., 2002). Moreover, grey is the most used achromatic color in the color studies to show the differences between colors (Clarke & Costall, 2008; Helvacıoğlu, 2011; Kaya & Epps, 2004; Özmen, 2014; Valdez & Mehrabian, 1974; Yıldırım et. al., 2011).

In order to evaluate the color effects on emotional states (pleasure, arousal, dominance), a study was carried out by Valdez and Mehrabian (1994). The lighting was controlled by conducting the experiment in a windowless room with only using artificial lighting that acts like daylight. Red, yellow, green, blue, purple, yellow-red, green-yellow, blue-green, purple-blue, and red-purple were selected as color samples from Munsell Color System to reveal ten hues with different levels of saturation. Pleasure – Arousal – Dominance (PAD) scale was used as feeling descriptor. The findings of the study showed that more saturated and brighter colors are unraveled more pleasant; less bright and more saturated colors were unraveled more arousing and caused greater feelings of dominance in participants. Moreover, short wavelength hues (cool hues such as blues, greens and purples) were found as being the more pleasant and preferable than long wavelength hues (warm hues such as reds, yellows, oranges). In addition to these, pleasure was decreased from white to black. Although white was the most pleasant achromatic color, black was the least pleasant achromatic color. Greys had intermediate values in terms of pleasantness. Arousal levels were the lowest for white color, increasing consistently for black (Valdez & Mehrabian, 1994). These findings are consistent with a study, which was done by Bellizzi et al. (1983). They carried out a study to enable better understanding the effect of colors on people in a retail store design with using five colors, which are red, yellow, blue, green and white. Twenty five women were exposed to those colors on a furniture display. The findings indicated that warm colors were found as being unpleasant and less preferable than cool colors.

The results of the following researches also suggested that a warm color environment, especially red, stimulates higher anxiety and feeling of arousal, while cool color

environments like blue were prone to reveal lower anxiety and arousal (Ainsworth et. al., 1993; Jacobs & Suess, 1975; Kwallek et. al., 1997). Emotionally warm colors have been linked with elated mood state (Schaie & Heiss, 1964), arousal (Cahoon, 1969) and higher level of anxiety (Jacobs & Suess, 1975), although cool colors have shown the opposite influences. Cool colors have been linked with terms as peaceful, calm, restful (Sharpe, 1974) and with more favorable evaluations and higher excitement than orange interiors (Babin et. al., 2003).

According to Helvacıoğlu (2011), color is an essential factor to affect people's emotions in interior spaces. In order to understand emotional reactions to color in living room, the study was conducted by using self-report measure. Pure red, green, blue, grey were the selected colors. Participants first watch a short video indicating an overlook of a 3D model of a living room. Next, they were asked to match the each color living rooms with facial expressions of basic emotions, which were happiness, surprise, neutral, anger, disgust and fear. The results showed that red walls were associated with disgust and happiness, while the least stated emotions were sadness, fear, anger, and surprise. Grey walls evoked the feeling of disgust, neutral and sadness. Neutral and happiness were the most evoked feeling for the room with green walls whereas anger, surprise, fear and sadness were the least evoked ones. The most evoked emotion related for the room with blue walls was neutral, while the least evoked emotions were anger and surprise. Moreover, another study was conducted to understand whether various colors evoke different feelings in living rooms or not by Yıldırım et al. (2011). Digital images of two imaginary living rooms were used instead of conducting experiment in real settings. The spatial characteristics of rooms were kept the same for each of the experiment with only

altering the colors: warm, cool, or achromatic colors. The results indicated that warm colors had a tendency to feeling of high arousal, exciting and stimulating whereas cool colors were associated with not very arousing, but to be rated higher on spacious and restful. It is stated that cool and achromatic colors reveal calmer and more peaceful emotions.

Besides, in order to analyze the effect of colors on the emotional responses, Suk and Irtel (2009) investigated two empirical studies for the effect on color media on people by using 36 color stimuli, which are used concerning hue and tone categorizations by depending on the CIELAB system. In both experiments, the subjects evaluate the emotional states to each color stimulus with Self-Assessment-Manikin (SAM), which is composed of three rows of five pictograms exemplifying the three dimensions of emotion. According to results of the study, the blue color is found as less exciting and more dominant than the other hues. The influence of color hues on emotion is also examined by Odom and Sholtz (2000) by using rating from one to ten scales with psychology students. Red, yellow, blue and a lighter shade of each with the adjectives; calm, cheerful and exciting are selected. The participants were asked to select a number on the rating scale next to each adjective describing an emotion The results indicate that primary colors, which are red, yellow and blue, are seen as more cheerful and exciting than non-primary colors even though non primary colors are found as more calming than primary colors. It is also seen that yellow is both cheerful and exciting while blue is related with being calm.

In addition to these, Manav's study (2007) focused on understanding existing idea about 'color' emphasizing on color-emotion relations by analyzing how color can be used to meet the human expectations in residences. Fifty participants from various age groups are asked to match adjectives with the proper color samples from the catalogue of a popular color firm in Turkey. The results of study demonstrate that the feelings of enjoyment, cheerfulness, and warmness are related with the color samples of yellow and pink; both blue and green color samples are associated with the calmness, peacefulness, relaxation, and modernism; in other respects color samples of green are found relatedly with boredom, fearfulness, mystery, anxiety, annoyance; blue samples are also demonstrated as calming but also are revealed as cold and dull; yellow samples are shown as dynamic, warm and cheerful.

Additionally, Kaya and Epps (2004) examine the cause of color emotion associations' with open-ended self-report measure and conduct a study with 98 college students. Color stimuli are selected from the Munsell Color System. Participants are asked to show their emotional responses to five principle hues (i.e., red, yellow, green, blue, purple), five intermediate hues (i.e., yellow-red, green-yellow, blue-green, purple-blue, and red-purple), and three achromatic colors (white, gray, and black) according to feelings. The results indicate that green color is more related with the positive emotions, consisting of the feeling of relaxation, pursued by happiness, comfort, peace, and hope and is identified with the nature and trees that form a feeling of comfort. As another example, yellow is demonstrated to be energetic and evoked positive emotions as it is related with the sun and the summer time. For the achromatic colors, white obtain a large number of positive emotions, pursued by the colors black and grey. These findings are also

consistent with Hemphill's studies carried out in 1996. Moreover, in the study of Clarke and Costall (2008), the findings also are consistent with Kaya and Epps (2004) results by forming a new method for emotional expression of color. The actual colors are not shown to the participants as different from past conducted studies in the same field in order to provide them with free imagination for their own sample colors. The results demonstrate that red, orange and yellow cause the more active emotions associated with the love, passion (red), anger, sunshine, warmth and sadness (yellow); blue and green evoke to calmness, relaxation, peacefulness, sadness and neutral; black symbolizes to power, strength and death. Grey color is considered as lacking emotion.

Table 1. Summary of the literature review related with the effect of colors on emotions.

Cool Colors	Warm Colors	Achromatic Colors	References
More pleasant & more preferable than warm colors	Less pleasant & less preferable than cool colors	Pleasantness: increase black to white Arousal: increase white to black	Valdez & Mehrabian, 1974
Pleasant and more preferable than warm colors	Unpleasant and less preferable than cool colors		Bellizzi et al., 1983
Lower anxiety & arousal	Higher anxiety & arousal		Ainsworth, et al., 1993 Cahoon, 1969 Jacobs & Suess, 1975 Kwallek, et. al.,1997
Peaceful, calm, restful,			Sharpe, 1974
Most associated with neutral & happiness Least associated with anger, surprise, fear & sadness	Most associated with disgust & happiness Least associated with sadness, fear, anger & surprise	Evoke the feeling of disgust, neutral and sadness	Helvacıoğlu, 2011
Not very arousing & higher on spacious and restful & reveal calmer and more peaceful emotions	High arousal, exciting and stimulating	Evoke calmer and more peaceful emotions	Yıldırım et al., 2011
Less exciting & More dominant other hues			Suk & Irtel, 2009

Table 1(cont'd)

More exciting, cheerful & calm	More exciting, cheerful		Odom & Sholtz, 2000 Babin et. al, 2003
Calmness, peacefulness, relaxation, modernism, boredom, fearfulness, mystery, anxiety, annoyance, cold &dull	Enjoyment, cheerfulness, warmness, dynamic, warm &cheerful		Manav, 2007
Positive emotions, relaxation, happiness, comfort, peace, hope & comfort	Energetic & positive emotions	Positive emotions: increase grey to white	Kaya & Epps , 2004 Hemphill, 1996
Calmness, relaxation, peacefulness, sadness & neutral	More active emotions, love, passion, anger, warmth & sadness	Power, strength, death & lacking emotion.	Clarke & Costall, 2008

Colors not only affect people's emotions as it was mentioned above, they also have various influences on people's behavioral intention. For example, in order to evaluate the relationship between a store's lighting and indoor color and the measures of buying and time spent in retail settings, a study was conducted by Barlı et al. (2012) with adult participants whose age range was from 20 to 60 years old. Two types of lighting (soft and bright) and 5 indoor colors (blue, yellow, green, red, and white) are selected for this study. The results indicate that green color has a positive effect on people's behavioral intentions in terms of time spent in the store and number of purchases although the opposite behavioral intentions are seen in the red setting. Time spent in store is also positively related with the soft lighting design and negatively related with red color scheme. Moreover, Babin et al. (2003) have carried out a study to understand people response to various color, lighting, and price point combinations in fashion-oriented stores. The results are observed with three ways between a store's environmental cues, people' cognitive categories, and shopping behaviors. For fashion-oriented stores, the

results indicate that blue interiors are related with more positive evaluations, higher excitement, and higher store patronage and purchase intentions than are orange interiors.

In addition to the studies of Barlı et al. (2012) and Babin et al. (2003), Bellizzi et. al. (1983) have carried out a study to provide better understanding for how color affects the behavior in a store environment. Five colors were selected to be used in the study, which are red, yellow, blue, green and white. Twenty-five women experienced each of those five colors on a furniture display in the retail setting. The findings proposed that cool color environment are recommended for retail store in terms of increasing time spend in a store and warm colors are found as unpleasant for people and may result in decreasing time spend of shopping trip. Warm colors are also found as appropriate for store window and entrances to increase purchase decisions. Moreover, Bellizzi and Hite (1992) conducted a study with red and blue color to understand whether cool or warm colors were more preferred in a retail setting. The study was conducted in two laboratory settings that were arranged to simulate store environments where red was implemented to one and blue to the other. The findings indicated that a blue background resulted in less delaying purchase intention than a red background would have. Therefore, it can be said that blue/violet environments increase the pleasure level and approach behavior in terms of purchase intentions more than orange/red environments would do.

In addition to these results, Özmen (2014) conducted a study for a better understanding of approach or avoidance behavior both with the hue of color and the location of it. The study is based on Mehrabian-Russell Stimulus Response Model and is carried out with six different participant groups in different color settings which are green, red and grey. The findings indicated that hue does not play an essential role on approach or avoidance

behavior. However, the location of color in the environment plays a significant effect in the orientation patterns of individuals that is related with approach/avoidance behavior. Moreover, it is examined that people have a tendency to go towards the differently colored part of the room.

Table 2. Summary of the literature review related with the effect of colors on behavioral intentions.

Cool Colors	Warm Colors	Achromatic colors	References
Positive effect on time spend & number of purchase	Negative effect on time spend & number of purchase		Barlı et al., 2012
Higher store patronage and purchase intentions	Lower store patronage and purchase intentions		Babin et. al., 2003
Increasing time spend	Decreasing time spend		Bellizzi et al., 1983
Increasing approach behavior in terms of purchase intention & less delaying purchase intention	Increasing avoidance behavior in terms of purchase intention & more delaying purchase intention		Bellizzi & Hite, 1992
No effect on approach or avoidance behavior	No effect on approach or avoidance behavior	No effect on approach or avoidance behavior	Özmen, 2014

The following review of color studies in the literature includes some methodological discussions related with each study. According to Park and Park (2013), applying color in a real context are differently comprehended than using color chips or papers as conducted in previous studies. Instead of using color chips, using actual color context for the experiment provide people with a chance to understand the color effects in real context. Moreover, not applying color in a real context is mentioned as research gap

defined from the previous reviews and using actual color context for the experiment reduces this gap (Nurlelawati et. al., 2012).

According to Gelineau (1981), although there is a substantial work on color, most of it is defective. Some past laboratory studies are often conducted with small and non-representative participants, some others are got mixed in terms of variables or stimulus of the experimental design and others are educed about the study enabled by the data. Researchers often get nowhere from examining for the color stimuli they used in especially in the past studies (Fehrman & Fehrman, 2000; Valdez & Mehrabian, 1994).

Color stimuli are normally identified by the three properties of color; hue, saturation and brightness (Valdez & Mehrabian, 1994). Many studies have failed to control brightness, saturation, light sources or background colors. To put it another way, if the hue is going to be examined, brightness and saturation should be brought under control (Meerum Terwogt & Hoeksma, 1995). Few studies benefit from the standard color order systems and those that do, used color samples that mixed all three properties of color (Gelineau,1981; Valdez & Mehrabian, 1994) complicating to contrasting results over studies (Gelineau, 1981).

One common discussion related to color studies is their failure to systematically screen for conceivable issues in color vision of participants (Gelineau, 1981). As a result, a certain number of conclusions related to color and its influence on humans cannot be generalized by reason of deficiency of attention in identifying the color stimuli used (Valdez & Mehrabian, 1994).

2.4. Interior Color Design in Hotel Rooms

Hotel businesses are divided into four groups according to their location in the city (Rutes, 1985; Yıldız, 2011).

- *Resort hotels* are especially designed for weekend holiday makers or long term holiday. They are located near the city of natural beauty or near the seaside or lake in order to take advantage of nature (Rutes, 1985; Yıldız, 2011).
- *Suburban hotels* have been developed for a night's rest in suburban area due to the getting away from city and the dense living conditions of it. Hotels accommodate those who want to relax and spend your vacation staying alone with nature (Rutes, 1985; Yıldız, 2011).
- *Thermal hotels* have been developed to benefit from the healing waters and hot springs and to stay at the hotel guests who come to be treated (Yıldız, 2011).
- *City hotels* are especially designed for short-term stay and business men who constantly have to travel. They are also political, social and reliable places to accommodate a center of the city and are important part of life in the city center (Rutes, 1985).

In the hotels, guestrooms types vary according to the hotel's quality, the environmental features and the standards set by the hotel management. Hotels consist of different types of guestrooms such as single, double, twin, triple, duplex, family room, suite, junior suite, executive suite, king suite and superior (Lawson, 1995). All these guestrooms require having a multifunctional space intended for guests resting, sleeping and working (Riewoldt, 2006). Guestrooms have different spatial zoning since more than one person might stay in the hotel guestroom and want to do different things at the same time

(Çakırkaya, 1994; Rutes, 1985). In this regard, depending on the action in a typical hotel guestroom it is possible to identify four different venues, which are bed section, living or work section, entrance section and wet area (Çakırkaya, 1994). According to Lawson (1995), the proportions of space depending on these functional requirements are 70% for the total room space (considering a normal single room) belongs to the bed and seating area, 14% for the entrance of the room and 20% for the bathroom and toilet. A guestroom of city hotels mainly contains the main items: bed, table, chair, sofa, and support for suitcases, wardrobe, TV, radio, refrigerator, air conditioner; minibar, built in safe, telephone and different characteristics of comfort (Lawson, 1995).

All the hotel guestrooms might seem as a similar, design in the guestrooms have occurred in the last few decades. The most important design area of the hotel is hotel guestrooms. Hotel guest rooms in contemporary times require meeting the ever enhancing expectations of the guests, whether it is business guests or leisure travelers. Original traditional style rooms, need to more design in contemporary modern hotels, with their finishes, mattresses, lighting, colors, and linens to enhance the satisfaction levels of their guests (Arıkan, 2013). The concept of the "hotel interior design" contains the layout, their style, decorations, furniture, colors, lighting, architecture and other items that influence the overall guest's interior perception (West & Purvis, 1992). All the components of the interior should be related with each other to ensure the integrity of design language. The most important thing here is the ability of a designer to state his idea towards the hotel guests by the way of the interior design. Nowadays, it is not sufficient to design a standard comfort that meets the expectations of the hotel guests. Due to the high competition on the market of hospitality, there is a presence of various

needs regarding the interior design, which should be catchy and unique, in order to make the guest to select the same hotel again (West & Hughes, 1991).

Interior colors play an essential role in creating a special atmosphere and influencing people's mood. Focusing on the color in a hotel guestroom setting where people sleep, work, relax or rest is essential to help body and physiology to regenerate, balance and harmony and to refresh emotional processes in the body (Doncean, 2013). Coloring in accommodation settings should be taken into consideration among various effective elements in interior design since successful color balance provides guests with making the living environment comfortable and meeting demands for high level interior design (Doncean 2013; Ursini, 2016).

The harmony and balance of colors in accommodation facilities like hotels has a positive influence on eliciting a feeling of comfort, enjoyment, relaxation, and rest (Doncean, 2013). Interior color design comprise of three main color components, which are respectively dominant color, secondary color and accent color. In order to achieve color balance in decorating accommodation settings, color scheme should be created to depend on certain proportions: 60% dominant color, 30% secondary color, and 10% accent color (Doncean, 2013; Dong, 2014; Timmons, 2014; Ursini, 2016). This certain proportions are mainly used to soften the stress level associated with the color orientation of interior environments (Ayana, 2012). Dominant color is usually formed by walls, floors and furniture of the room. The secondary color arises from color hues in upholstery, curtains, carpets or decorative objects like pillows based on furniture color. Accent color is used to complete the furnishing and decorative setups (Doncean, 2013;

Dong, 2014; Timmons, 2014; Ursini, 2016). A unified color scheme in accommodation facilities is enabled by altering furniture, curtain, carpets or accessories while keeping dominant color constant (Doncean, 2013; Dong, 2014). It means that if a change in color scheme is required, alteration should be applied on secondary color in the hotel guestroom while keeping the dominant and accent color constant.

Hotels capitalize on comfort, hospitality and relaxation when designing the color of their room. The exact selection of the main color is the first step to achieve successful interior color design. White, grey, pastels, neutrals or softer colors are suggested as an ideal main color because of being in harmony with other colors perfectly and creating on calm, restful, stylish and relaxing environment in hotel guestrooms (Dong, 2014; Wyndham Worldwide, 2012). Only using a main color in the room as neutrals or pastels might be too monotonous. Therefore, secondary or accent color are provided to make the interior space harmonious and lively. Browns, blues and greens are suggested as secondaries which are the most relaxing and calming colors (Rogers, 2004). In addition to that, according to guidelines, warm colors are also suggested to create warm, cozy and pleasant atmospheres in the hotel rooms (Disability services, 2004; Doncean, 2013). Moreover, red, black, strong or contrasts colors with dominant and secondary colors are suggested to be used as accent colors for creating unexpected touches (Dong, 2014; Wyndham Worldwide, 2012). The next chapter explains the emotional states and behavioral intentions model to acquire information.

CHAPTER III

EMOTIONAL STATES AND BEHAVIORAL INTENTIONS MODEL

3.1. Mehrabian & Russell Stimulus Response Model

Mehrabian-Russell (M-R) model (1974) is one of the most effective models and is a valuable theoretical base to present the influence of physical environment on people's emotions and behaviors. The model offers a paradigm of the stimulus-organism-response (S-0-R). An adequate S-0-R model has the following parts: stimulus taxonomy, a set of intervening or mediating variables, and response taxonomy. The interaction between the environmental stimuli (S) and people behavior (R) as intervened by the people's emotional states (O) offered an 'input-output' system where people's emotional reactions to environmental stimulus can cause different behaviors. Input is the environmental stimulus perceived from physical environment such as color, light, noise and smell and output refer to behavioral reactions such as expressing boredom and walking. Three aspects that Mehrabian (1976) mentions as basic emotional responses to an environmental stimulus, and the basis of all feelings are 'arousal, pleasure and dominance'. Moreover, approach-avoidance refers to behavioral response of emotional states revealed by environmental stimuli (Donovan & Rossiter, 1982; Mehrabian, 1976; Mehrabian & Russell, 1974).

Figure 10. Mehrabian-Russell (M-R) Model (Mehrabian & Russell, 1974).

As a summary, the model is comprised of three components: environmental stimuli (S), emotional states (O), and behavioral intentions (R). This model suggests that an individual (e.g., a hotel guest) receives environmental stimuli (e.g., color) from the physical surroundings, which creates an emotional state (pleasure, arousal, and dominance) in that person. In turn, this emotional state elicits behavioral intentions (approach or avoidance behavior) (Mehrabian & Russell, 1974) (see Figure 10).

3.1.1. Environmental Stimulus

Choosing the proper environmental stimulus factor is greatly difficult by the reason of the complex and changing combinations of stimuli experienced in any physical environment. M-R model (1974) presents a general measure of the different types of stimulus factors and is appropriate to any physical environment. There are two possible ways of analyzing the influence of the environment on behavior with regard to the environment holistically (information load), or with regard to the possible influence of a single environmental dimension (Sferi, 2000). Information load is described with regard

to novelty and complexity. Novelty implies how much an environment is unfamiliar, new, unexpected, and surprising, and complexity states factors such as number of elements, and extent of change or motion (Mehrabian, 1976). Moreover, a single environmental dimension refers to focus on one component of the environmental dimensions while keeping the other variables constant (Sferi, 2000).

Information load environments are studied in different fields. For example, store atmosphere in store and retail context (Baker, 1997; Baker et. al., 1992; Donovan & Rossiter, 1982; Kotler, 1974; Spies et. al., 1997; Yoo et. al., 1998), dining atmospherics, physical environment and servicescape in restaurant context (Ellen & Zhang, 2014; Jang & Namkung, 2011; Liu & Jang, 2009; Ryu & Jang, 2007; Ryu et. al., 2012; Yekanialibeiglou, 2015), scent and music in store environment context (Mattilla & Wirtz, 2006), sensory environment in spa context (Kang et. al., 2011), music and color in online store context (Cheng et. al., 2009), product, services and physical surroundings in marketing context (Bitner, 1982; Obermiller & Bitner, 1985), color and lighting in fashion-oriented store (Babin et. al., 2003) and atmospherics in commercial environment context (Ramlee & Said, 2014) are used as an information load environmental stimulus. Moreover, a single environmental dimension is also examined in studies. Color in shopping mall, retail setting and bank interior contexts (Chebat & Morrin, 2007; Crowley, 1993; Özmen, 2014; Sferi, 2000), music in the women' fashion store and retail setting contexts (Sweeney & Wyber, 2002; Yalch & Spangenberg, 1990) and scent in shopping mall context (Chebat & Michon, 2003) and lighting in hotel guestroom context (Pae, 2009; Park et. al., 2010). The present study will use the latter method and pay particular attention to one component, color.

3.1.2. Emotional States

According to the M-R (1974) model, people are stimulated by the environmental stimulus, such as lighting, the color scheme, scent or noise level. These stimuli in turn stimulate emotional responses in people known as PAD: Pleasure, Arousal, and Dominance. These basic emotional states, which are pleasure-displeasure, arousal-disarousal, and dominance-submissiveness, behave as mediating variables between environmental stimuli and approach-avoidance behaviors. Each dimension is independent of the other two dimensions. The model suggests that every emotional state of people may be explained as an association of these three dimensions. Pleasure-displeasure mentions to the degree where people feel happy, joyful, contented, or satisfied. Arousal-nonarousal refers to people's level of activity, excitement, stimulation, or alertness. Dominance-submissiveness is to the extent where people feel unrestricted or in control of the situation. Mehrabian and Russell (1974) also suggest that the three basic emotional statements to all environments consist of pleasure, arousal, and dominance. They indicate that in consideration of comprehending people's interactions with various environments, it is important to recognize those responses that are the immediate outcome of stimulation and that take place in changing degrees in all environments.

Nevertheless, in the previous studies, less attention was paid to dominance scale (Chebat & Michon, 2003; Mattilla & Wirtz, 2006; Park et.al., 2010). Russell and Pratt (1980) propose that the dominance dimension should be extruded from the Mehrabian and Russell model. Russell and Pratt (1980) discuss in the later study that since dominance needs a knowledgeable interpretation by people, it is not purely applicable in situations

calling for emotional responses. According to Russell and Pratt (1980), the two emotional states, which are pleasure and arousal, are sufficient to show people' affective responses to all types of situations. They refer that evidence for the suitability of the dominance dimension, on the other hand, is quite tenuous.

In addition to these, although it is not the main focus of the present study, the previous studies show that emotional states (responses) has been paid regard to as prior to people's behavioral intentions. For instance, pleasant shopping environments provide people with a positive impact on approaching orientation (Donovan & Rossiter, 1982; Baker et al., 1992; Spies et al., 1997; Sweeney & Wyber, 2002), purchasing intentions (Spies et al., 1997), spending time of visit (Baker et. al., 1992; Donovan & Rossiter, 1982), attitudes (Spies et al., 1997; Yoo et al., 1998; Wirtz & Bateson, 1999; Yalch & Spangenberg, 2000) and evaluations (Obermiller & Bitner, 1984; Bitner, 1992; Yalch & Spangenberg, 2000). Furthermore, environmental stimuli that cause arousal is also shown to be connected with enhancing approach behavior (Baker et al., 1992).

3.1.3. Behavioral Intentions

According to Mehrabian and Russell (1974), the behavior intentions of people in certain environments can be considered as one of two possibilities: approach or avoidance. Approach and avoidance behavior are illustrated by the variety of means through a person indicating his/her preference or lack of reference for situation, for example, willing to stay in, to find out it, to verbally state his/her liking for it, to interact with

other people in the environment (variations in affiliation) or his/her behavioral intentions of tasks in the environment (variations in work performance) (Mehrabian & Russell, 1974) (see Table 3).

Table 3. Four basic behavioral intentions (responses) in the case of approach/avoidance.

Intention	Approach Behavior	Avoidance Behavior
Physical	willing to stay in return to the environment	willing to leave leave for good to the environment
Exploratory	investigate the items	stay inanimate
Communicative	verbally express his or her liking for it	verbally express his or her disliking for it

Approach is described as any positive behavior in and toward an environment and people in it. It consists of staying longer, exploring, coming back to the environment, interacting with other people in the environment. On the other hand, avoidance describes any behavior opposite of approach. The avoidance behavior would assert the contrary of what was identified above. These approach and avoidance behavior are accordant with people behavior in consumption settings (Baker, 1987). Moreover, all these behavior intentions, which are desiring to stay in the environment, expressing his/her liking for the environment and returning to the environment, are known as loyalty intention in marketing and hospitality studies (Bowen & Shoemaker, 1998; Getty & Thompson, 1994; Kaufman & Haynes, 1981).

3.2. Review of M-R Model Studies

Previous studies in the literature are mostly conducted in retailing, marketing and dining context. In the retailing and marketing contexts, Baker et al. (1992) examined the influences of two retail atmospheric factors: ambient factors (music and lighting), and social factors (friendliness/number of employees) on people's pleasure, arousal and willingness to buy. The results showed that music and lighting associate with social factors to affect people's pleasure and social factors affect people's arousal in the store environment. These emotional states had positive association with people's willingness to buy. The results are also consistent with the Donovan and Rossiter's (1982) study. They test the M-R model in retail settings and it was found that two major emotional states, which are pleasure and arousal, were significant mediators of people's behavioral intentions in the store. Spies et al. (1997) also investigated the influence of store characteristics on people' satisfaction, mood and their purchasing behavior. Two furniture stores altering in respect to their atmosphere, the results demonstrated that direct effect of store atmosphere as well as to an indirect effect intervened by people's mood. The pleasant environment in the store revealed approach behavior in terms of spending more money. In addition to these, Chebat and Michon (2003) explored the influence of ambient scents in a shopping mall environment by depending on two competing models, M- R model (Mehrabian & Russel, 1974) and the emotion – cognition model (Zajonc & Markus, 1985). The findings indicated that people's perceptions of the retail environment and product quality mediate the influences of ambient scent factors on emotions and spending behaviors.

In the dining context, Ellen and Zhang (2014) examined the influence of servicescape on people's emotional states and behavioral intentions. Data was collected by using guests at the company restaurant in the Hauge. The results showed that ambient conditions, signs and artifacts had a significant influence on pleasure and arousal and pleasure have a significant influence on people's behavioral intentions. Another study conducted by Ryu and Jang (2007) explored the effect of restaurant's dining environments on people's emotions and behavioral intentions. The study demonstrated that facility aesthetics, layout and ambiance as dining environments have significant influence on pleasure, whereas employees and facility aesthetic between physical environments have direct effect on behavioral intentions. Pleasure plays an essential role on people's behavioral intentions. Moreover, Liu and Jang (2009) investigated the associations between dining atmospherics, emotional responses, perceived value, and behavioral intentions by using Chinese restaurants. The results indicated that dining atmospherics have significant influence on people' emotions, and perceived value. Furthermore, emotions and perceived value also affect people's dining behavioral intentions. Perceived value is a moderator between emotional responses and behavioral intentions. A study carried out by Yekanialibeiglou (2015) evaluated the impact of physical environment on people's emotions and behavioral intentions at upscale restaurants in Ankara by depending on M-R (1974) model. The result of the study showed that the facility aesthetics had a positive influence on arousal state; ambience on dominance and pleasure scales; table set up on pleasure state; and layout on dominance and arousal states. In addition to these results, it was also found that ambience and table set up dimensions have a direct effect on behavioral intentions. Pleasure and dominance are significant mediators of behavioral intentions.

In the other contexts, Kang et al. (2011) conducted a study to evaluate the relationships between environmental sensory components (i.e., sight, sound, smell, and touch), people emotions, and people behavioral intentions in a spa context by applying the M-R (1974) model. The results of the study demonstrated that touch and sight have significant effects on pleasure, and sound has a direct effect on people's behavioral intentions. Pleasure has a significant impact on people's behavioral intentions; whereas, arousal has not effect on people's behavioral intentions. Moreover, another study was conducted in a bank interior context to understand the effect of the color scheme on people's evaluations of the bank and its employees (Sferi, 2000). In terms of hue, warm color schemes have a higher effect on courtesy, whereas the cool color schemes have higher influence on competence. Warm hues are found to be more aesthetically pleasing and more familiar than the cool ones. In addition to these studies, other study is carried out in hotel guestroom context by a digitally generated hotel guestroom to examine the influence of different lighting conditions on people's emotional states, preferences and behavioral intentions according to different cultures, North Americans and South Koreans (Pae, 2009; Park et al., 2010). The findings indicate that dim lighting is more arousing than bright lighting according to American participants, whereas bright lighting is more arousing than dim lighting for participants of Korea. Koreans prefer warm color and high intensity lighting, while American participants prefer warm color and low intensity lighting in the hotel guestroom. In addition to these results, it is also indicated that warm color and low intensity lighting have significant effect on pleasure state according to Americans, whereas Korean participants perceive warm color and high intensity lighting as the most pleasant one. Furthermore, this study show that the color and intensity of lighting influence people's behavioral intentions in terms of loyalty in hotel guestrooms.

As a summary, as it was mentioned above in the example studies, it can be said that physical environment plays an essential role on effecting people's emotion and behavioral intentions in different contexts. In the next chapter, the experiment part of the study is identified. Parts of the study, aim of the study and method of the study are explained in detail.

CHAPTER IV

THE EXPERIMENT

4.1. Aim of the Study

M-R (1974) model was adapted in this study to investigate the effect of different color schemes on people's emotional state and behavioral intentions in city hotel guestrooms. Parts of the study are divided into three: environmental stimuli, emotional states and behavioral intentions (see Figure 11).

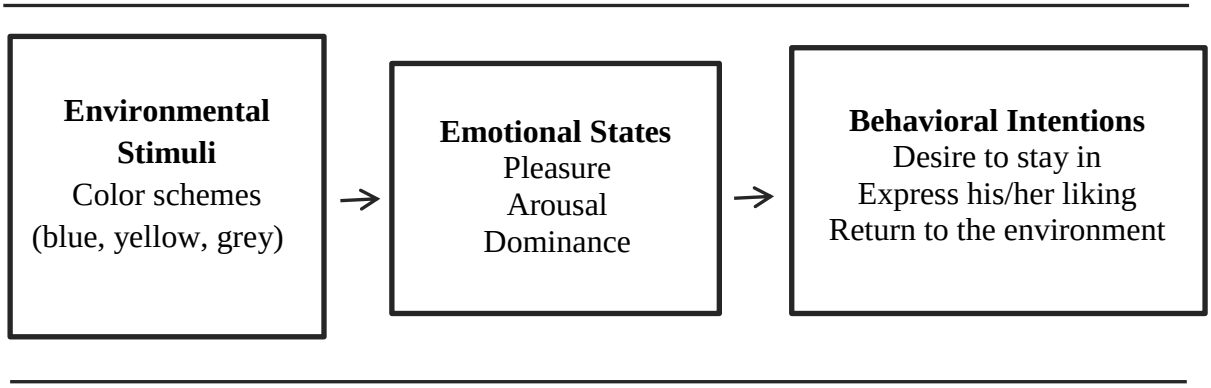

Figure 11. Parts of the study.

According to the M-R model (1974), people are stimulated by the environmental stimulus such as lighting, color, scent, noise etc. In this study, yellow as a warm, blue as a cool and grey as an achromatic color schemes are the environmental stimuli.

These stimuli are hypothesed to elicit emotional responses in people as pleasure, arousal and dominance. Pleasure states the degree to which a person feels happy, pleased, good, or joyful in the physical environment, while arousal symbolize the extent to which a person feels active, relaxed or stimulated. Dominance is identified as the degree to which a person feels important, influential, or in control (Mehrabian & Russell, 1974). However, in subsequent studies, dominance factor have not been used as an emotional response (Russell & Pratt, 1980; Ward & Russell, 1981). According to Russell (1991), dominance is not an important effect on emotion and behavior and it is more related with the cognitive response. Nonetheless, this study will retain Mehrabian and Russell's (1974) original tridimensional model and test to find out if, in fact, the dominance dimension is significant or insignificant in city hotel guestrooms in terms of the effect on color schemes on emotional states.

The characteristics of behavioral intentions are congruously associated with the aspects of approach-avoidance behavior, which is the third component of the M-R model. Approach behavior is identified as staying longer, exploring, interacting with other people in the physical environment or coming back, although avoidance behavior refers to opposite of approach behavior (Mehrabian & Rusell, 1974). In this study, desiring to stay in the environment, expressing his/her liking for the environment and returning to

the environment are taken into the consideration to understand the effects of color schemes on behavioral intentions in terms of loyalty in hotel guestrooms.

The primary purpose of this study is to explore the effects of colors on people's emotions and behavioral intentions in a real world city hotel guestroom context. The specific focuses of this study are on:

- How colors affect people’s emotional states (pleasure, arousal, dominance) in city hotel guestrooms,
- How colors affect people’s behavioral intentions in city hotel guestrooms,
- How people’s emotional states (pleasure, arousal, dominance) affect their behavioral intentions in city hotel guestrooms.

4.1.1. Research Questions

The research questions of the study are as follows:

1) Is there a significant difference between the effects of colors on people’s emotional states in city hotel guestrooms?

3) Is there a significant difference between the effects of colors on people’s behavioral intentions in city hotel guestrooms?

3) Is there a relationship between the emotional states and behavioral intentions in city hotel guestrooms?

4.1.2. Hypotheses

The main and sub hypotheses of the study are as follows:

H1. There is a significant difference between the effects of different color schemes on pleasant state in city hotel guestrooms.

H1a. Blue evokes pleasantness in city hotel guestrooms.

H1b. Yellow evokes displeasure in city hotel guestrooms.

H1c. Grey has a neutral effect on people's pleasure state in city hotel guestrooms.

H2. There is a significant difference between the effects of different color schemes on arousal state in city hotel guestrooms.

H1a. Blue evokes unarousal in city hotel guestrooms.

H1b. Yellow evokes arousal in city hotel guestrooms

H1c. Grey has a neutral effect on people's arousal state in city hotel guestrooms.

H3. There is a significant difference between the effects of different color schemes on behavioral intentions in city hotel guestrooms.

H3a. Blue is associated with approach behavior in city hotel guestrooms.

H3b. Yellow is associated with avoidance behavior in city hotel guestrooms

H3c. Grey is associated with neither approach nor avoidance behavior in city hotel guestrooms.

H4a. There is a positive relationship between the pleasure and approach behavior in city hotel guestrooms.

b. There is a positive relationship between the arousal and avoidance behavior in city hotel guestrooms.

4.2. Method of the Study

The method of the study is explained under the following sections: sample group, instruments and phases.

4.2.1. Sample Group

The participants were chosen by snowball sampling method who participated in the survey voluntarily. The total sample group was 300 adult participants and the experiment was conducted at Marina Sentido Suits in Kuşadası, Turkey. The experiment was performed with three different sample groups who were exposed to different color schemes in the same hotel room.

In this study, some specific criteria were taken into consideration when choosing the participants as follows: (1) adults between 18 to 65 years old; (2) having no eye or vision deficiencies; (3) using correction equipment (contact lenses, eyeglasses, etc.) for any eye or vision deficiencies; (4) having received no courses or training related to color

during their education; (5) have not worked as a professional to gain knowledge of color outside educational institutes; (6) are not color blind.

Participants, who were younger than 18 or older than 65, were excluded from this experiment. Moreover, to control prior knowledge, participants who had taken color courses in their educations or worked as a professional were excluded from the study. People who have prior knowledge about color are in tendency to perceive the environment differently than other people according to emotions and preferences (Gifford, 2002). In addition to this, color perception is a vital skill that was needed from the participants in this experiment. In this context, all subjects were asked whether or not they had any visual impairments (such as color blindness) or eye deficiencies that could not be corrected by eyeglasses or contact lenses. Participants who had any visual impairments or eye deficiencies that could not be corrected by eyeglasses or contact lenses were excluded from the study. This study did not specifically concentrate on gender, education level or frequency of hotel visits per year. This data were asked for portraying the demographic characteristics of the sample group.

The responses of 273 participants were used for the final data analysis, after eliminating the participants who did not comply with any of the criterion described above. The excluded participants were:

(1) Six participants who were younger than 18 or older than 65 (age criterion)

(2) Two participants who did not use correction equipment, although they had an eye deficiency (using correction equipment criterion)

(3) One participant who received color courses during his/her education (color education criterion)

(4) Twelve participants who received color courses during their education and worked as a professional related to color (color education and work criterion)

(5) Two participants who did not fit the age, color education and work criterion

(6) Four participants who were color blind (color blind criterion) (see Appendix A).

4.2.2. Instrument of the Experiment

The data collection instrument for this study is a self-administrated questionnaire. The questionnaire is presented in four sections. Section one is designed to obtain demographic information and section two and three present a series of questions to evaluate the effects of color hues on guests' emotional states and behavioral intentions in city hotel rooms. In the last section, the questionnaire ends with information about the survey.

In the first part, demographic information is asked to get information about the guests' demographic backgrounds. Questions of demographic information are related to age, gender, education level, visiting hotels per year, eye or color deficiencies, using any correction equipment, receiving any courses or training related to color, working as a professional related to color and being color blind (see Appendix B).

In the second part, the measures for emotional states (pleasure, arousal and pleasure) are based on Mehrabian and Russell's PAD model and the questions are adapted from

previous study (Yekanialibeiglou, 2015) according to the hotel room setting. In this part, participants assess their emotional states (pleasure, arousal and pleasure) with regard to color scheme of the room. The questionnaire compromises of three scales and 18 sets of bipolar adjective pairs. The three scales, which are pleasure, arousal and dominance, create emotional state and each scale is comprised of six bipolar adjective pairs. Pleasure scale includes bored-relaxed, despairing- hopeful, unhappy-happy, melancholic-contented, annoyed-pleased and unsatisfied-satisfied whereas the arousal scale includes calm-excited, unaroused-aroused, dull-jittery, relaxed-stimulated, sleepy-wide awake and sluggish-frenzied. Dominance scale has also six bipolar adjective pairs consisting of submissive-dominant, cared for-in control, guided-autonomous, influenced-influential, controlled-controlling and awed-important. Positively weighted adjectives are on the right side of each pair and negatively weighted adjectives are on the left side of each pair. Responses on each pair are anchored by -2= extremely negative to +2= extremely positive with a score of 0= neutral (see Appendix B)

In the third part, the measures for behavioral intentions (approach and avoidance) are based on M-R model according to the hotel room setting and the question model is adapted from previous studies (Bitner, 1992; Pae, 2009). To evaluate behavioral intentions, participants are asked about the following three statements: ‘I would like to come back to this hotel in the future’, ‘I would recommend this hotel guestroom to my friends’ and ‘I am willing to stay longer than I planned at this hotel guestroom’. Participants responded to these questions using a 5 point Likert scale; 1= extremely disagree to 5= extremely agree with a score 3=neutral. In the scale, extremely disagree

and disagree scales refer to avoidance behavior, whereas agree and extremely agree scales refer to approach behavior in the hotel room (see Appendix B).

In the last part, the questionnaire ends with information about the survey. Indicating the reason why this study is conducted and how the demographic information is requested from the participants. In addition to this, contact information of the researcher and the supervisor are provided for the participants (see Appendix B).

4.2.3. Description of the Site

This experiment focuses on the effect of color in city hotel guestrooms. To understand the emotional and behavior responses to color in hotel guestrooms, choosing a suitable hotel room as an experiment setting is a critical aspects of the study. In order to achieve this, while choosing an experiment hotel guestroom, some important criteria came to the forefront: (1) the location of the hotel; (2) the participant population of the hotel; (3) the characteristics of the city hotel guestroom; (4) simplicity and color of furniture in the hotel guestroom; (5) the color scheme of the hotel guestroom. When all these criteria were taken into consideration, the executive room of Sentido Marina Suits was chosen as an experiment setting in this study.

Sentido Marina Suits is a four star city hotel and a part of Paloma Hotel Chain in Kuşadası, Turkey. The hotel is located in the heart of Kuşadası city center. The hotel welcomes guests who are at least 16 years old. The study focuses on city hotels located

in city centers and the target population of this study is an adult population. Thus, the location and guest population of the hotel had a power to meet expectations related to hotel criteria.

All the rooms of the hotel have the characteristics of a city hotel, simple decoration with a double bed and seating areas. All furniture of the room have a neutral color scheme, which is a tone of grey as being lack of hue. Achromatic color scheme dominates the room and there is no color effect introduced by hotel room itself, except from the pillows and bedspread (see Figure 12). To eliminate the possible effects of furniture color in the experiment room, color scheme of existing furniture in the room fits the purpose of the study.

Figure 12. Existing hotel room without pillows and bedspread.

After evaluating all these qualities, an executive room of Sentido Marina Suits Kuşadası, Turkey was chosen as an experiment setting to satisfy the expectations about hotel guestroom criteria. The area of the room is 41m² and ceiling height is 2.80m. All the walls are painted in beige, the ceiling are painted in matte white and the floor is covered with gray-beige ceramic tile. The guestroom is very modernly set up, equipped with a double bed and seating areas.

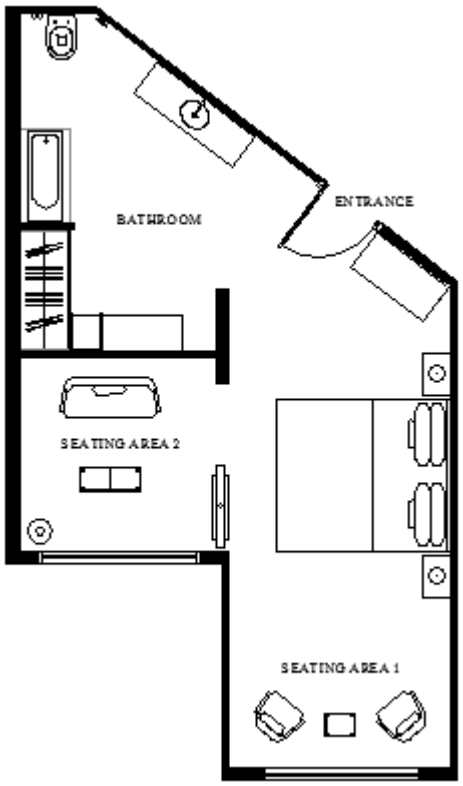

Figure 13. Plan of the experiment hotel guestroom (not to scale).

Each unit has a simple decoration. Achromatic color scheme dominates the room as a color scheme of the experiment guestroom. Chromatic colors like light pink are only

used for pillows and bedspread as a secondary color in the room (see Figure 13, Appendix F).

The room is illuminated both artificially and naturally. Color and light is an inseparable whole in stimulating perception and emotion of people in the spaces (Biner & Butler, 1989; Fotios & Levermore, 1999; Heerwagen & Heerwagen, 1986). In this study, in order to control the possible effects of daylighting on perception of color scheme, all windows of the room were covered with thick and black paperboards for preventing the penetration of daylight (see Figure 14, 15).

Figure 14. Window of seating area 1 with black paperboards.

Figure 15. Window of seating area 2 with black paperboards.

Artificial lighting was chosen as an only lighting method in the experiment hotel guestroom. Recessed lighting, pendant downward light and standing lamp are the existing artificial lighting fixtures and specifications of light sources used in these fixtures are shown in Table 4.

Table 4. Specifications of the light sources of the experiment room.

Lighting Fixtures	**Light source**	**CCT**	**CRI**
Recessed lighting	Philips DN135B LED10S/830 PSU II WH	3000 K	over than 80
Standing lamp	Philips 13, 5 W (100 W) E27 Yellow Non-dimmable Bulbs	2700 K	80
Pendant downward light	Philips 6 W (40 W) E27 Yellow Non-dimmable Bulbs	2700 K	80

Either natural or artificial, the change in illumination level, correlated color temperature (CCT) and color rendition (CRI) of light influences the overall feeling of an interior space (IES, 1987). CCT states light source's warmth or coolness like yellowish white, or neutral in appearance, not the spectral energy distribution or the physical temperature and CRI is identified as the measure of how well the light source renders color (Egan & Olgyay, 2002). It can be known as the influence of the light source on the color appearance of objects (Rea, 2000). In hospitality settings as hotel rooms, preferred color temperatures ranges between 2500 and 3200 K; light source of CRI should be at least 80 or more (Kaufman & Haynes, 1981; Rea, 2000; Steffy, 2002). Thus, the CCT and CRI level were suitable for the hotel room light and the existing light sources of the room were kept the same during the experiment process for all color schemes.

According to IESNA recommended illuminance values, the illuminance level ranges should be 200 to 500 lux in hotel bedrooms (Rea, 2000). After covering all windows with black paperboards, the illuminance level was measured by using Konica Minolta T-1 Illuminance Meter on the bed, on sitting group in seating area 1 and in seating area 2. The illuminance values were 205 lux on bed, 292 lux on seating group 1 and 215 lux on seating group 2. Therefore, the illuminance levels for all areas in the room were within the range of recommended values for hotel rooms. The existing illuminance level of the room was also kept the same during the experiment process for all color schemes.

4.2.4. Specifying the Colors and Color Alterations

This study also focuses on the effects of color on people's emotional states and behavioral intentions in hotel guestrooms. Thus, specifying the color and color alterations' place in the room was the basis of the experiment. Specifying the color and color alteration for the experiment took place in four phases; (1) literature review; (2) research on real life application projects; (3) color alterations' place; (4) choosing the correct color from fabric swatch.

In the first phase, previously conducted color studies were examined. It was clearly understood that primary colors were preferred instead of using secondary colors, and cool and warm colors were used to see the biggest differences between the effects of color. Since, warms colors (red and yellow) have produced opposite physiological, psychological and emotional effects to cool colors (blue and green), which are opposite on the color spectrum. Red as a warm color and blue as a cool color were the most preferred colors in the studies to show these differences (Bellizzi & Hite, 1992; Camgöz et. al., 2002; Elliot et. al., 2007; Gerend & Sias, 2009; Hulbert & Ling, 2007; Manav, 2007; Pastoureau, 2001; Valdez & Mehrabian, 1994; Wogalter et. al., 2002).

In the second phase, although it was obviously seen that red and blue were the most selected colors according to previous research, it was not a sufficient criteria to choose blue and red for the color scheme of a hotel room. Previous studies were generally conducted in a virtual environment or laboratory settings by showing photos or color chips; however, this study focuses on the effect of colors in a real environmental context. As a second phase, over than 250 photos of city hotel rooms from different

countries in Booking Web site, which were randomly selected, were analyzed to see which colors were mostly used in various city hotel rooms (www.booking.com /index.tr.html) (see Table 5). The most preferred colors in hotel rooms were the tones of blue, turquois as a cool color and brown, orange, red, yellow as a warm color (see Appendix E). In the light of this information, blue was chosen as being present both literature studies and real hotel contexts. After selecting blue as a cool color, yellow located directly opposite to blue in NCS (1996) was chosen as a warm color (see Figure 16).

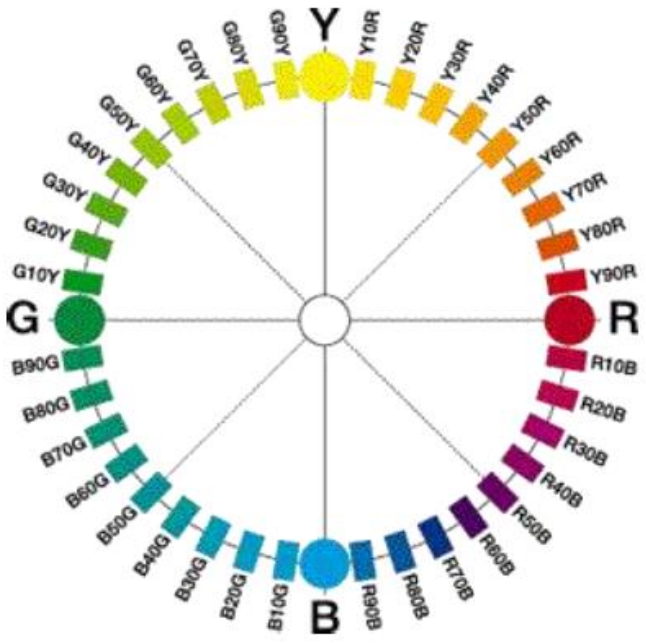

Figure 16. NCS color circle.

(http://www.ncscolour.com/en/natural-colour-system/logic-behind-the-system/)

Table 5. Numbers of randomly selected city hotel guestrooms in different countries.

Countries	Cities	The numbers of city hotel rooms
Turkey	İstanbul	16
	Ankara	6
	İzmir	6
	Antalya	6
	Mardin	6
	Erzurum	6
	Samsun	6
Paris	France	10
Denmark	Copenhagen	10
Italy	Milan	10
Norway	Oslo	10
Spain	Madrid	10
Sweden	Stockholm	10
China	Beiging	10
Brazil	Rio de Jenerio	10
Russia	Moscow	10
United States	Los Angeles	6
	California	6

Table 5 (con'd)

	New York	6
England	London	10
Germany	Berlin	10
Greece	Athens	10
Czech Republic	Prague	10
Austria	Vienna	10
Switzerland	Bern	10
Belgium	Brussels	10
Egypt	Cairo	10
Iran	Tehran	10
Lebanon	Beirut	10
India	New Delhi	10
Japan	Tokyo	10
New Zeeland	Wellington	10
Mexico	Mexico City	10

In the third phase, where to apply the color alteration was investigated. According to the literature, color schemes should be created in a balance depending on certain proportions: 60% dominant color as wall color, 30% secondary color as upholstery color and 10% accent color as accessory color in the room is suggested (Donceon, 2013; Dong, 2014; Timmons, 2014; Ursini, 2016). In addition to this, if it is desired to make a change on color scheme in the hotel room, the color alteration should be applied on secondary color while keeping the dominant and accent color constant (Donceon, 2013; Dong, 2014). Thus, in this study, while keeping also all the other variables constant in the guestroom, all the alterations of the color scheme was applied to fabric of bedspread and pillows, which were the secondary color of the room.

In the last phase, the exact colors from the fabric swatches were chosen. In order to achieve this, the yellow and blue color fabrics obtained from different stores were compared under 6500K of light (see Appendix E). 6500K is known as daylight lamp, which gives a chance to comprehend colors in the most accurate way (Egan & Olgyay, 2002).

In the end, S3040-B blue fabric, S3040-Y10R yellow fabric and S3502-Y grey were chosen for this experiment (see Figures 17, 18 & 19). The fabric of these three colors were particularly selected on the basis from NCS as corresponding colors with regard to whiteness, blackness and lightness to ensure these values are fixed, only leaving the hue as a variable. The new bedspreads and pillows for hotel guestroom were prepared with selected fabrics.

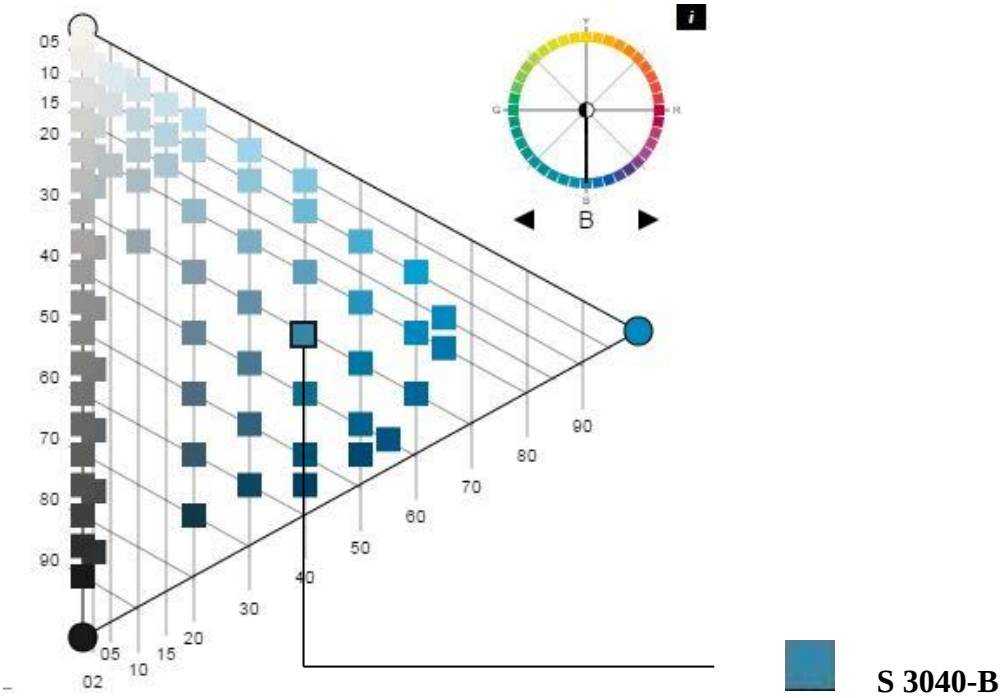

Figure 17. NCS illustration for blue color scheme.

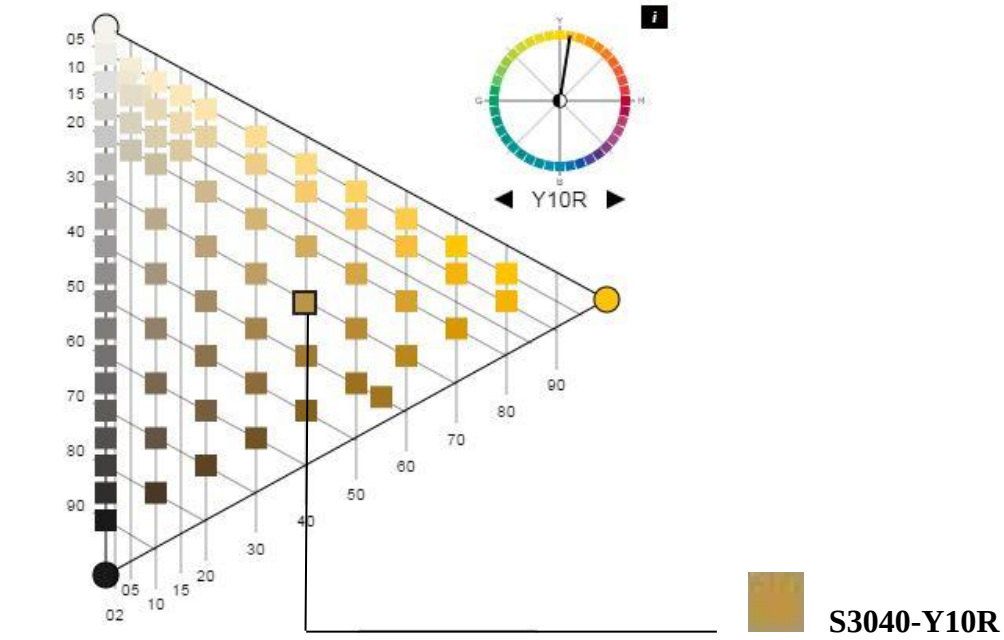

Figure 18. NCS illustration for yellow color scheme.

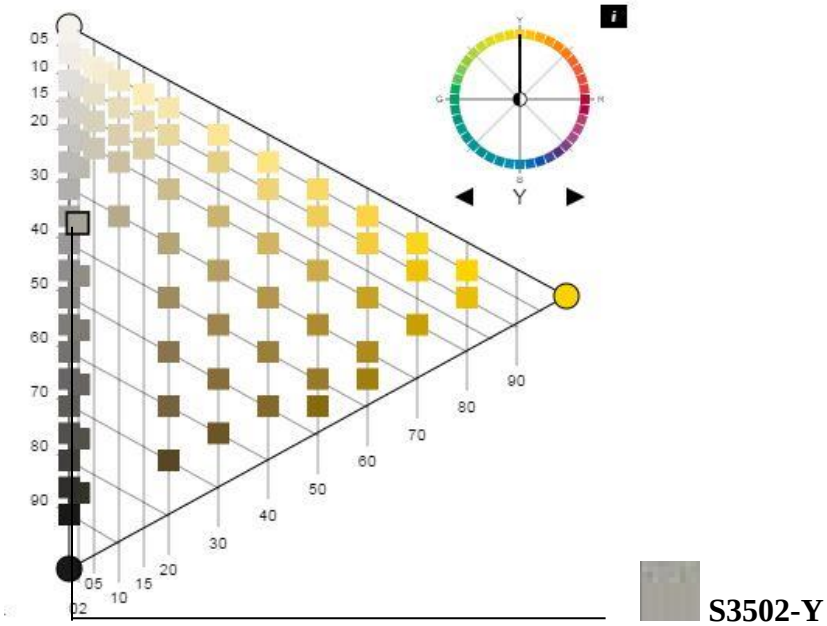

Figure 19. NCS illustration for grey color schemes.

During the experiment, the identical experiment settings were arranged in the same hotel guestroom with color schemes creating one cool color hotel room, one warm color hotel room, and one achromatic color hotel room through changing bedspreads and pillows. S3040-B blue bedspread and pillows were used as cool color scheme for the first experiment setting, S3040-Y10R yellow bedspread and pillows were used as warm color scheme for the second experiment setting and S3502-Y grey bedspread and pillows were used as the achromatic control scheme for the third experiment setting (see Figure 20, 21, 22; Appendix G).

Figure 20. Blue color scheme in the experiment hotel room.

Figure 21. Yellow color scheme in the experiment hotel room.

Figure 22. Grey color scheme in the experiment hotel room.

4.2.5. Procedure of the Experiment

The permission for carrying on a study was obtained from the chairman of the executive board of Paloma Hotels. The experiment room was open 1pm – 8pm during the whole week for this experiment. Therefore, the study was carried out during these hours. The experiment was carried out between January 1, 2016 and February 8, 2016 with 300 participants. To evaluate the effects of color hues on people's emotional states and behavioral intentions in city hotel guestrooms, in the same hotel room, three identical experiment settings with different color schemes were generated. The experiment was performed with different sample groups for the three different color schemes in the same experiment room among different dates (see Table 6).

Table 6. Number of participants for each color scheme before the elimination due to exclusion criteria.

Colors Scheme	Before elimination	Experiment Data
Cool color scheme (BLUE)	100 participants	January 1 – January 13, 2016
Warm color scheme (YELLOW)	100 participants	January 14 – January 26, 2016
Achromatic color scheme (GREY)	100 participants	January 27 –February 8, 2016

In the first twelve days between 1pm and 8pm, 100 participants participated to the study in experiment hotel guestroom under the same conditions with the blue color scheme (see Figure 23; Appendix H).

Figure 23. Participant under blue color scheme.

In the following twelve days between 1pm and 8pm, another 100 participants attended to the study in the experiment hotel guestroom under the same conditions with the yellow color scheme (see Figure 24; Appendix H).

Figure 24. Participant under yellow color scheme.

The last twelve days between 1pm and 8pm, another 100 participants got involved in the study in the experiment hotel guestroom under the same conditions with the grey color scheme (see Figure 25; Appendix H).

Figure 25. Participant under grey color scheme.

The experiments were conducted in two phases. In the first phase, participants were asked to complete a demographic questionnaire about them, before they had any visual contact with the experiment hotel guestroom. The participants were asked whether they had any eye or vision deficiencies. If the participants have any vision or eye deficiencies, they were asked to wear their correction equipment such as contact lenses or eyeglasses. After they completed the demographic questionnaire, participants were also given Ishihara's Tests for Color Blindness (Ishihara, 1975) (see Appendix D). After this test, participants were informed about the procedure of the experiment orally however; participants were not told of the research objectives to prevent bias. Then, the participants are told to enter the guestroom.

In the second phase, for three settings, at the beginning of each data collection session, participants were asked to put aside any previous experience or personal opinions about hotels they might have visited in the past and do whatever they like to within the experiment hotel guestroom. Completing the questionnaire took approximately 5 minutes, but no time limits were set to the participants. Before starting to answer the questions, they touched furniture, laid in bed or sat down on the seat to comprehend color according to them. Participants begin to answer the questionnaire when they felt ready. After completing the questionnaire, participants were invited to sit down in the seating area and then were served a cup of coffee and cupcakes as token of appreciation.

This experimental procedure was repeated for each color scheme in the same experiment hotel guestroom with different participants. In between color schemes, the room was closed between 7pm and 8pm at the last day of the experiment. The pillows and

bedspread were replaced with the new pillows and bedspreads having a different color scheme. The pillows and bedspread were arranged in the same way with the previous experiment condition.

I n the next chapter, findings related to demographic information, the statistical analysis and evaluation of the date acquired from the experiment are clarified. In addition, the findings are discussed and compared with previous studies' results in the literature.

CHAPTER V

RESULTS

5.1. Findings

This part consists of three sub parts; findings related to demographic information, findings from the statistical analysis of data and other findings. Statistical Package for the Social Sciences (SPSS) 20.0 was used to analyze the data collected with the questionnaires. In the first sub part, descriptive analysis was done to portray the demographic characteristics of the participants. In the second part, for analyzing the data Kruskall Wallis- H test, Mann Whitney –U test, Correlation analysis and factor analysis were used.

5.1.2. Findings Related to Demographic Information

After eliminating the participants who did not comply with the criteria to be a participant, 273 participants were used for the final data analysis as 91 participants for blue color scheme, 92 participants for yellow color scheme, and 90 participants for grey color scheme. The demographic characteristics of 273 participants are demonstrated in Table 7.

Table 7. Characteristics of participants (n=273).

Characteristic		**n**	**%**
Gender	Male	111	40.7
	Female	162	59.3
Age	18-25	46	16.8
	26-35	78	28.6
	36-45	50	18.3
	46-5	62	22.7
	56-65	37	13.6
Educational Background	Primary School	20	7.3
	High School	77	28.2
	University	151	55.3
	Master – PhDs	25	9.2
Hotel visiting a year	1-3/ year	140	51.3
	4-6/ year	51	18.7
	7-9/ year	36	13.2
	More than 9/ year	46	16.8
Eye or vision deficiencies	Yes	110	40.3
	No	163	59.7
Correction Equipment	Yes	110	40.3
	No	163	59.7
Color courses during education	No	273	100.0
Work as a professional	No	273	100.0
Color blind	No	273	100.0

Among the total participants, there were 162 female participants (59.3%) and 111 male participants (40.7%). The sample group of this study was adults whose age ranged from 18 to 65. A stable age distribution was seen between age ratios (see Figure 26).

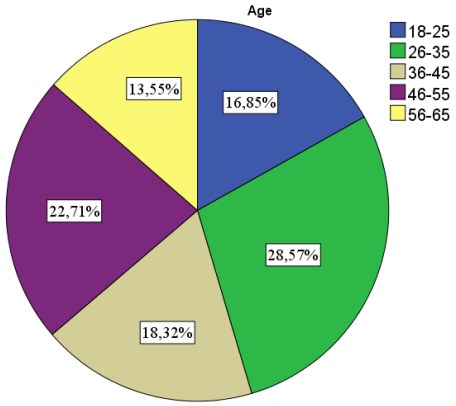

Figure 26. Age distribution of participants.

In terms of educational background, vast majority of the participants (83.5%) graduated from high school or university. 7.3% of the participants had primary school education, although 9.2% of the participants got a Master or PhDs degree (see Figure 27).

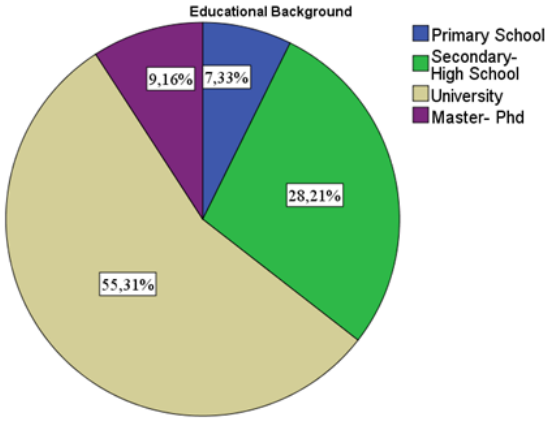

Figure 27. Educational background distribution of participants.

Statistical findings related to hotel visits per year indicated that almost half of participants (51.3%) visited a hotel once to three times in a year, followed by 18.7% participants who stayed four to six times 16.8% participants stayed more than nine times a year and 13.2% participants stayed seven to nine times in a year (see Figure 28).

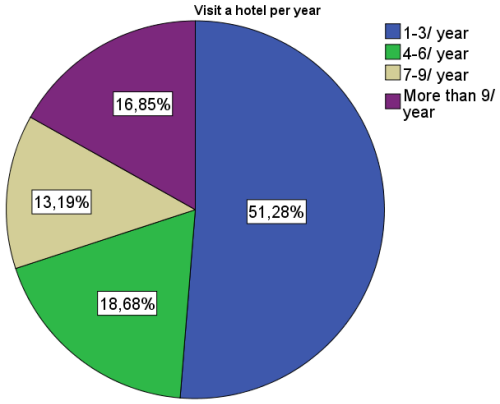

Figure 28. Visit a hotel per year distribution of participants.

Although 40.3% subjects had visual impairment, all of them used their correction equipment to overcome deficiencies and there was nobody who was color blind. Moreover, none of the participants received color courses during their education and none of them worked in a profession related to color.

5.1.2. Findings from the Statistical Analysis

Before performing the statistical tests, the statistical analysis started to examine the internal consistency reliability of the questions. Internal consistency reliability is

evaluated by computing a statistic known as Cronbach's coefficient alpha and is implemented to groups of items measuring different ways of the identical variable or quality (Litwin, 1995). According to the commonly accepted rule for identifying the internal consistency (Mallery, 1999), where $\alpha \geq 0.9$ is excellent, $0.7 \leq \alpha < 0.9$ is good, $0.6 \leq \alpha < 0.7$ is acceptable, $0.5 \leq \alpha < 0.6$ is poor and finally, $\alpha < 0.5$ is concerned with as unacceptable. According to Reynaldo and Santos (1999), the scale is richer in reliability when the score of the alpha coefficient high and the score of alpha coefficient should be over than 0.70 to be acceptable reliability coefficient. Thus, reliability of questions was examined by Cronbach's coefficient alpha. All parts of the questions apart from dominance dimension, had an Alpha value of over 0.70 (acceptable) (see Table 8).

Table 8. Crombach's alpha values according to different color schemes for each part.

Color Scheme	**Part**	**Cronbach's Alpha**
Blue Color Scheme	Emotional States	0.900
	Pleasure	0.898
	Arousal	0.895
	Dominance	0.760
	Behavioral Intentions	0.919
Yellow Color Scheme	Emotional States	0.901
	Pleasure	0.900
	Arousal	0.820
	Dominance	0.757
	Behavioral Intentions	0.879
Grey Color Scheme	Emotional States	0.941
	Pleasure	0.949
	Arousal	0.865
	Dominance	0.585
	Behavioral Intentions	0.939

According to data analysis, although some items in dominance dimension for blue color scheme and for yellow color scheme were acceptable ($0.6 \leq \alpha < 0.7$), all items in dominance dimension for grey color scheme were not reliable due to their poor ($0.5 \leq \alpha < 0.6$) and unacceptable ($\alpha < 0.5$) alpha values (see Appendix J.1). Therefore, to obtain good reliability and provide identical variable or quality for all color schemes, dominance part of the emotional states was eliminated from the results because of their low alpha values.

After the reliability test was conducted, normality tests are used to determine whether the data set is normally distributed or not. According to Kolmogorov- Smirnov and Shapiro-Wilk Normality test results, pleasure, arousal, emotional states and behavioral intentions values were not normally distributed in different color schemes (**$p<0.05$**) (see Appendix J.2). Therefore, nonparametric test was used to analyze the data of this study. In addition to this, floor and ceiling effect were taken into consideration during the statistical analysis.

5.1.2.1. The Effects of Colors on People's Emotional States

5.1.2.1.1. Pleasure State

Kruskall Wallis- H test, which determine whether there is a significant difference between the mean of three or more independent sample groups was used to evaluate the effects of different color schemes on people's emotional states. The results showed that

there was a significant difference between the pleasure state according to color schemes (H=51.302; SD=2; **p=0.0001**; p<0.05) (see Appendix J.3).

In order to find out the differences caused by each color, Mann-Whitney U tests were used. The significance levels of all effects for each color scheme were accepted as 0.0167 by applying the Bonferroni correction (Field & Hole, 2008). The test results showed that there was not a significant difference between the effect of blue color scheme and yellow color scheme on people's pleasure state (U=4052.5; p=0.708; p>0.0167; 2-tailed). However, there was a significant difference between blue and grey color schemes (U=1954; **p=0.0001**; p<0.0167; 2-tailed) and yellow and grey color schemes ((U=1903; **p=0.0001**; p<0.0167; 2-tailed) on people's pleasure state in city hotel guestrooms (see Appendix J.4). Therefore, it was found that there is not a significant difference between the effects of cool and warm color schemes on pleasure state, whereas there is a significant difference between the effect of achromatic and chromatic colors.

In order to understand how pleasure state was affected by color schemes, the mean values for all color schemes were compared. According to the evaluation of the findings, if the mean score was above the mid-point (0), it means that the color has positive effect on pleasure and evokes pleasure. On the other hand, if the mean score is below the mid-point (0), it implies that the color has a negative effect on pleasure and reveals displeasure. The results showed that the means of pleasure state for blue and yellow color schemes were found above the mid-point (0) of the scale in the positive range (m=0.95 for blue color scheme; m=1.00 for yellow color scheme), mean of pleasure

states for grey color scheme were found in the negative range (M= -0.17 for grey color scheme) (see Figure 29). The results stated that although blue color and yellow color are found as pleasant, grey color scheme is found as unpleasant in city hotel rooms.

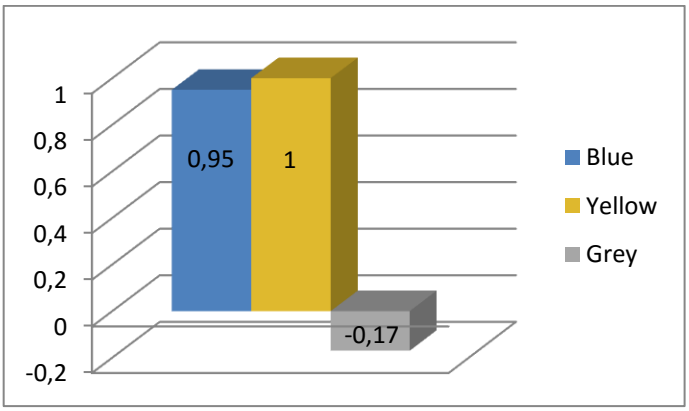

Figure 29. Mean scores of pleasure state according to different color schemes.

5.1.2.1.2. Arousal State

Kruskall Wallis- H test was implemented to estimate the effects of different color schemes on arousal state of emotion. The results indicated that there is a significant difference between the arousal state according to color schemes (H=30.027; SD=2; **p=0.0001**; p<0.05) (see Appendix J.3).

Mann-Whitney U tests were used to comprehend the differences caused by each color. The test results showed that there was not a significant difference between the effect of the blue color scheme and yellow color scheme (U=3306; p=0.018; p>0.0167; 2-tailed). However, there was a significant difference between the blue and grey color schemes

(U=3001.5**; p=0.002**; p<0.0167; 2-tailed) and between the yellow and grey color schemes (U=2220.5**; p=0.001**; p<0.0167; 2-tailed) on people's arousal states in city hotel guestrooms (see Appendix J.4). Therefore, it was found that there is a significant difference between the effects of chromatic and achromatic color schemes on arousal state.

In order to understand how arousal state was affected by the color schemes, in terms of the evaluation of the findings, mean scores were analyzed. If the mean score is above the mid-point (0), it means that the color has positive effect on arousal and evokes arousal. Besides, if the mean score is below the mid-point (0), it means that color has a negative effect on arousal state and evokes no arousal. The results indicated that the mean of arousal state for yellow color schemes was found above the mid-point (0) in the positive range (m=0.25 for yellow color scheme), the means of arousal states for blue and grey color scheme were found below in the negative range (m= -0.01 for blue color scheme; m= -0.46 for grey color scheme) (see Figure 30). The results indicated that although yellow color scheme is found arousing, grey color scheme is found unarousing in city hotel guestrooms. Blue is found as too close to either arousal or no arousal. It is also indicated that this is very close to mid-point so does not mean an unaousal state but neither aroused nor unaroused state.

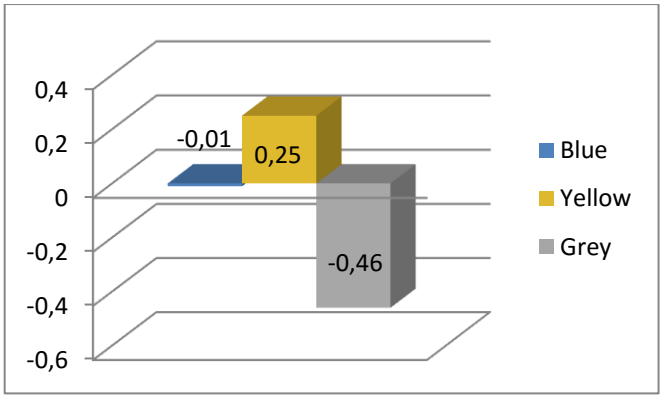

Figure 30. Mean scores of arousal state according to different color schemes.

5.1.2.2. The Effects of Colors on People's Behavioral Intentions

Kruskall Wallis- H test was used to understand the effects of different color schemes on behavioral intentions. The results indicated that there was a significant difference between the behavioral intentions according to color schemes (H=59.019; SD=2; **p=0.0001**; p<0.05) (see Appendix J.3). Therefore, there is a significant difference between the effects of warm, cool and achromatic colors on guest's behavioral intentions in city hotel guestrooms.

Mann-Whitney U tests were implemented to evaluate the differences caused by each color. The test results indicated that there was not a significant difference between the effect of blue color scheme and yellow color scheme on people's behavioral intentions (U=3463.5; p=0.041; p>0.0167; 2-tailed). However, there was a significant difference between blue and grey color schemes (U=2081.50; **p=0.0001**; p<0.0167; 2-tailed) and yellow and grey color schemes ((U=1605.5; **p=0.0001**; p<0.0167; 2-tailed) on people's

behavioral intentions in city hotel rooms (see Appendix J.4). Thus, it is shown that there is not a significant difference between the effects of warm and cool color schemes, whereas there is a significant difference between the achromatic and chromatic color schemes.

In order to understand how behavioral intentions were affected by the color schemes, the mean values for all color schemes were compared. According to the evaluation of the findings, if the mean score was above the mid-point (3), it means that the color has positive effect on behavioral intention and evokes the approach behavior. On the other hand, if the mean score is below the mid-point (3), it implies that color has a negative effect on behavioral intentions and evokes avoidance behaviors. The results indicated that the means of behavioral intentions for blue and yellow color schemes were found above the mid-point (3) of scale in the positive range (m=3.74 for blue color scheme; m=4.08 for yellow color scheme). On the other hand, the mean of behavioral intentions for grey color scheme were found below the mid-point (3) of scale in the negative range (m= 2.48 for grey color scheme) (see Figure 31).

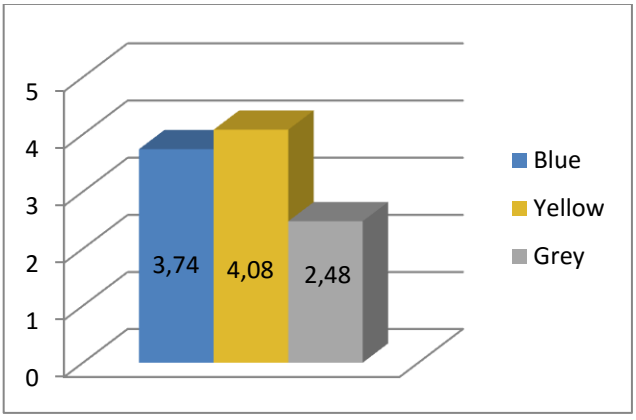

Figure 31. Mean scores of behavioral intentions according to different color schemes.

5.1.2.3. The Effects of People's Emotional States on Behavioral Intentions

Using the correlation analysis, the relation between people's emotional states and behavioral intentions for each color scheme are investigated. According to Argyrous (2011), the commonly accepted rule for identifying the associations, where $\lambda = 0$ is no association, $0 < \lambda < 0.2$ is very weak, negligible relationship, $0.2 < \lambda < 0.4$ is weak, low association, $0.4 < \lambda < 0.7$ is moderate association, $0.7 < \lambda < 0.9$ strong, high, marked association, $0.9 < \lambda < 1.0$ is very high, very strong relationship and $\lambda = 1.0$ is perfect association. In addition to this, if the beginning of the number value is higher than 0 (>0), it means that there is a positive association between variables. Besides, if the mark the beginning of the value is lower than 0 (<0), it implies that there is a negative association between the variables. If the value is equal to 0 (=0), it identifies that there is no association between the variables (Argyrous, 2011).

The results showed that there was a positive moderate association among pleasure and behavioral intentions under the blue color scheme ($r=0.637$, $p=0.0001$; $p<0.05$, 2-tailed), and among pleasure and behavioral intentions under the yellow color scheme ($r=0.668$, $p=0.0001$; $p<0.05$, 2-tailed). Moreover, positive high association among pleasure and behavioral intentions was found under the grey color scheme ($r=0.705$, $p=0.0001$; $p<0.05$, 2-tailed) (see Appendix J.5). While pleasure is increasing, behavioral intentions in terms of approach behavior are significantly increasing. Therefore, it is regarded that pleasure has a positive effect on behavioral intentions in city hotel rooms under all color schemes.

There was a positive weak association between the arousal and behavioral intentions under the blue color scheme (r=0.328, p=0.002; p<0.05, 2-tailed). The positive moderate association was found between arousal and behavioral intentions under the yellow color scheme (r=0.515, p=0.0001; p<0.05, 2-tailed), and under the grey color scheme (r=0.540, p=0.0001; p<0.05, 2-tailed) (see Appendix J.5). While people felt aroused, their behavioral intentions in terms of approach behavior are also increasing. Therefore, it is seen that arousal has a positive effect on behavioral intentions in city hotel rooms.

5.1.3. Itemized Analysis

Kruskall Wallis- H test was used to understand the effects of different color schemes on individual items by using adjective pairs. The results indicated that there was a significant difference between bored - relaxed (H=30.522; SD=2; **p=0.0001**; p<0.05), despairing - hopeful (H=18.102; SD=2; **p=0.0001**; p<0.05), unhappy - happy (H=53.749; SD=2; **p=0.0001**; p<0.05), melancholic - contented (H=54.930; SD=2; **p=0.0001**; p<0.05), annoyed - pleased (H=52.27; SD=2; **p=0.0001**; p<0.05), unsatisfied - satisfied (H=61.316; SD=2; **p=0.0001**; p<0.05), calm - excited (H=11.235; SD=2; **p=0.004**; p<0.05), unaroused - aroused (H=20.612; SD=2; **p=0.0001**; p<0.05), dull - jittery (H=15.617; SD=2; **p=0.0001**; p<0.05), relaxed - stimulated (H=17.291; SD=2; **p=0.0001**; p<0.05), sleepy - wide awake (H=26.323; SD=2; **p=0.0001**; p<0.05) and sluggish - frenzied (H=19.159; SD=2; **p=0.0001**; p<0.05) items according to three color schemes (see Table 9; Appendix J.3). Therefore, it is said that there is a significant

difference between the effects of warm, cool and achromatic colors on all items in city hotel guestrooms.

Table 9: Summary of the findings of the itemized analysis for all color schemes.

Items	There is a significant difference
bored - relaxed	p= 0.0001
despairing - hopeful	p= 0.0001
unhappy - happy	p= 0.0001
melancholic - contented	p= 0.0001
annoyed - pleased	p= 0.0001
unsatisfied - satisfied	p= 0.0001
calm - excited	p= 0.004
unaroused - aroused	p= 0.0001
dull - jittery	p= 0.0001
relaxed - stimulated	p= 0.0001
sleepy – wide awake	p= 0.0001
sluggish - frenzied	p= 0.0001

Mann-Whitney U tests were implemented to evaluate the differences caused by each color. The test results indicated that there was not a significant difference between the effect of blue color scheme and yellow color scheme on bored - relaxed (U=3906; p=0.398; p>0.0167; 2-tailed), despairing - hopeful (U=4000.5; p=0.587; p>0.0167; 2-tailed), unhappy - happy (U=3944.5; p=0.469; p>0.0167; 2-tailed), melancholic - contented (U=3915; p=0.414; p>0.0167; 2-tailed), annoyed - pleased (U=4179.5; p=0.984; p>0.0167; 2-tailed), unsatisfied - satisfied (U=3875; p=0.348; p>0.0167; 2-

tailed), calm - excited (U=3651; p=0.122; p>0.0167; 2-tailed), unaroused -aroused (U=3612; p=0.091; p>0.0167; 2-tailed), dull - jittery (U=4151; p=0.913; p>0.0167; 2-tailed), relaxed - stimulated (U=3540; p=0.061; p>0.0167; 2-tailed), sleepy - wide awake (U=3410; p=0.026; p>0.0167; 2-tailed) and sluggish - frenzied (U=3445; p=0.033; p>0.0167; 2-tailed) items (see Table 10; Appendix J.4). Therefore, it was indicated that there is not a significant difference between the effect of cool and warm colors on all items of emotional states in city hotel guestrooms.

Table 10: Summary of the findings of the itemized analysis for blue and yellow color schemes .

Items	There is not a significant difference
bored - relaxed	p= 0.398
despairing - hopeful	p= 0.587
unhappy - happy	p= 0.469
melancholic - contented	p= 0414
annoyed - pleased	p= 0.984
unsatisfied - satisfied	p=0.348
calm - excited	p= 0.122
unaroused - aroused	p= 0.091
dull - jittery	p= 0.913
relaxed - stimulated	p= 0.061
sleepy – wide awake	p= 0.026
sluggish - frenzied	p= 0.033

Moreover, there was a significant difference between blue and grey color schemes on bored - relaxed (U=2638; **p=0.0001**; p<0.0167; 2-tailed), despairing - hopeful (U=2811.5; **p=0.0001**; p<0.0167; 2-tailed), unhappy - happy (U=1867.5; **p=0.0001**; p<0.0167; 2-tailed), melancholic - contented (U=2040.5; **p=0.0001**; p<0.0167; 2-tailed), annoyed - pleased (U=2012; **p=0.0001**; p<0.0167; 2-tailed), unsatisfied - satisfied (U=1926; **p=0.0001**; p<0.0167; 2-tailed),unaroused - aroused (U=3070; **p=0.003**; p<0.0167; 2-tailed),dull - jittery (U=3024; **p=0.0001**; p<0.0167; 2-tailed) and sleepy - wide awake (U=3196; **p=0.009**; p<0.0167; 2-tailed) items. On the other hand, there was a significant difference between blue and grey color schemes on calm - excited (U=3507.5; p=0.086; p>0.0167; 2-tailed), relaxed – stimulated (U=3328; p=0.25; p>0.0167; 2-tailed) and sluggish - frenzied (U=3365; p=0.033; p>0.0167; 2-tailed) items (see Table 11; Appendix J.4).

Table 11: Summary of the findings of the itemized analysis for blue and grey color schemes .

Items	There is a significant difference	There is not a significant difference
bored - relaxed	p= 0.0001	
despairing - hopeful	p= 0.0001	
unhappy - happy	p= 0.0001	
melancholic - contented	p= 0.0001	
annoyed - pleased	p= 0.0001	
unsatisfied - satisfied	p= 0.0001	
calm - excited		p= 0.086
unaroused - aroused	p= 0.003	

Table 11 (cont'd)

dull - jittery	p= 0.0001	
relaxed - stimulated		p= 0.25
sleepy – wide awake	p= 0.009	
sluggish - frenzied		p= 0.033

In addition to these, there was a significant difference between yellow and grey color schemes on bored - relaxed (U=2380; **p=0.0001**; p<0.0167; 2-tailed), despairing - hopeful (U=2925.5; **p=0.0001**; p<0.0167; 2-tailed), unhappy - happy (U=2048.5; **p=0.0001**; p<0.0167; 2-tailed), melancholic - contented (U=1854.5; **p=0.0001**; p<0.0167; 2-tailed), annoyed - pleased (U=2061.5; **p=0.0001**; p<0.0167; 2-tailed), unsatisfied - satisfied (U=1715.5; **p=0.0001**; p<0.0167; 2-tailed),calm - excited (U=2969; **p=0.0001**; p<0.0167; 2-tailed),unaroused - aroused (U=2646; **p=0.0001**; p<0.0167; 2-tailed),dull - jittery (U=2964; **p=0.0001**; p<0.0167; 2-tailed), relaxed - stimulated (U=2709; **p=0.0001**; p<0.0167; 2-tailed), sleepy - wide awake (U=2315.5; **p=0.0001**; p<0.0167; 2-tailed) and sluggish – frenzied (U=2610; **p=0.0001**; p<0.0167; 2-tailed) items (see Table 12 ; Appendix J.4). Therefore, it is indicated that there is a significant difference between the warm and achromatic color schemes on all items of emotional states in city hotel guestrooms.

Table 12: Summary of the findings of the itemized analysis for yellow and grey color schemes .

Items	There is a significant difference
bored - relaxed	p= 0.0001
despairing - hopeful	p= 0.0001
unhappy - happy	p= 0.0001
melancholic - contented	p= 0.0001
annoyed - pleased	p= 0.0001
unsatisfied - satisfied	p= 0.0001
calm - excited	p= 0.0001
unaroused - aroused	p= 0.0001
dull - jittery	p= 0.0001
relaxed - stimulated	p= 0.0001
sleepy – wide awake	p= 0.0001
sluggish - frenzied	p= 0.0001

Mean scores were deeply evaluated in bipolar adjective pairs where $-2<m<-1$ is extremely negative range, $-1<m<0$ is negative range, $m=0$ is neutral, $0<m<+1$ is positive range and $+1<m<+2$ is extremely positive. Firstly, according the findings for blue color scheme, mean scores for each item of people's emotional states ranged from -0.286 (negative) for 'calm - excited in arousal state to +1.352 (extremely positive) for 'annoyed-pleased' in pleasure state (see Figure 32). In between the pleasure items, participants chose 2 items as 'positive' (relaxed, hopeful) and 4 items as 'extremely positive' (happy, contented, pleased, satisfied). Participants felt 3 items as 'negative'

(calm, dull, relaxed) and 3 items as ‘positive’ (aroused, wide awake, frenzied) of arousal states (see Appendix J.3). Therefore, it was demonstrated that the feelings of relaxed, hopeful, happy, contented, pleased, satisfied, calm, dull, jittery, aroused, wide awake and frenzied are evoked in the cool color scheme in city hotel guestrooms. Secondly, according to the findings for yellow color scheme, mean scores for each item of people’s emotional states varied between -0.141 (negative) for ‘dull – jittery’ in arousal state and +1.348 (extremely positive) for ‘annoyed-pleased’ in pleasure state (see Figure 32). Among the pleasure items, participants selected 2 items as ‘positive’ (relaxed, hopeful) and 4 items as ‘extremely positive’ (happy, contented, pleased, satisfied). Participants perceived 1 item as ‘negative’ (dull) and 5 items as ‘positive’ (excited, aroused, wide awake, frenzied) of arousal states (see Appendix J.3). Thus, it was shown that the feelings of relaxed, hopeful, happy, contented, pleased, satisfied, dull, excited, aroused, wide awake and frenzied were revealed in warm color schemes in city hotel guestrooms. Lastly, according to the findings for grey color scheme, mean scores for each item of people’s emotional states ranged from -0.622 (negative) for ‘calm-excited’ and ‘dull-jittery’ in pleasure state to +0.11 (positive) for ‘annoyed-pleased’ in pleasure state (see Figure 32). Between the pleasure items, participants preferred 5 items as ‘negative’ (bored, despairing, unhappy, melancholic, unsatisfied) and 1 item as ‘positive’ (pleased). Participants selected all items as ‘negative’ (calm, unaroused, dull, relaxed, sleepy, sluggish) in arousal state. As a result, it was indicated that the feelings of bored, despairing, unhappy, melancholic, unsatisfied, pleased, calm, unaroused, dull, relaxed, sleepy and sluggish are revealed in warm color schemes in city hotel guestrooms.

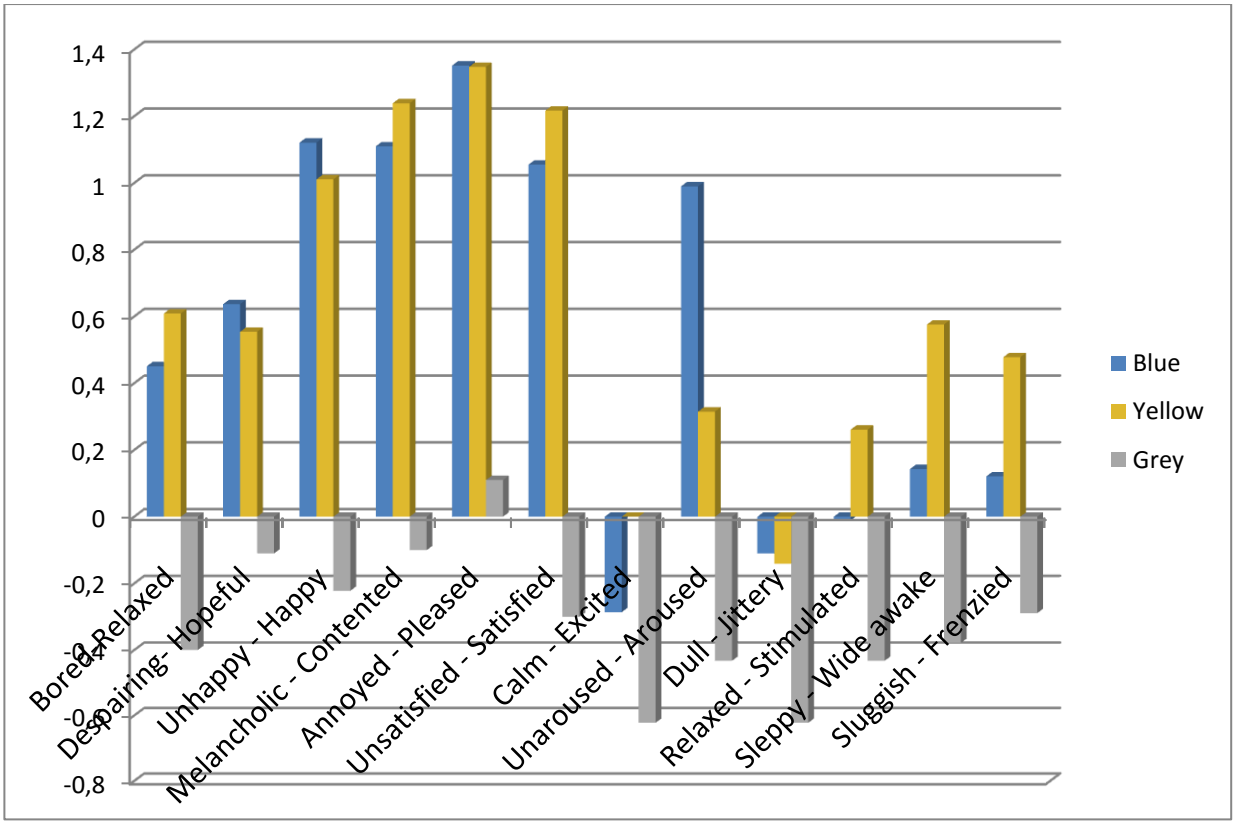

Figure 32. Mean scores of all items of emotional states according to different color schemes.

5.1.4. Factor Analysis

In order to test emotional states related feelings in each color scheme 12 adjective pairs were also analyzed with factor analysis. Factor analysis test is used to group related items under a factor and to order these items according to their importance. Thus, list of prioritized factors and their items are attained (Demirkan & Olguntürk, 2013).

In order to understand the factors related items for people's emotional states under the blue color scheme, firstly, a principal component analysis was carried out on the

correlations of 12 items of emotional states for the blue color scheme. The correlation matrix of 12 items was examined to decide if the strength of the correlation between the questions was reliable for factor analysis; since no item was found below 0.30; all items of the experiment were kept. Secondly, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was examined to understand whether the factor analysis was modelled or not for this date set composed of 12 items. According to Field (2000), Kaiser-Meyer-Olkin Measure should be at least 0.50 or more to be acceptable for the factor analysis. The results indicated that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.885 so the value was acceptable. The 12 items were divided as two different factors. Both factors had at least 3 items; therefore, 2 factors were taken into consideration for being the most important factors (see Appendix J.6). These two factors were counted for the 67.912% of the variance. An orthogonal factor rotation was fulfilled by use of the varimax with Kaiser Normalization. With larger loading, an item's pure measure of the factor increases in accordance with Tabachnick and Fidell (1996). Items that had correlation 50% and above with the factor component were considered for identifying the factor and its concerning scale the best. The prioritized 'emotional states' factors and the corresponding loadings of the items on these three factors are shown in Table 13. The factors contained only the items with 0.50 or more loading weights.

Table 13. Factor analysis results for blue color scheme.

	Factor	
	I	II
Arousal		
Sluggish – Frenzied	0.879	
Sleepy – Wide awake	0.871	
Calm – Excited	0.793	
Relaxed – Stimulated	0.785	
Unaroused – Aroused	0.745	
Dull – Jittery	0.667	
Pleasure		
Annoyed – Pleased		0.888
Unsatisfied – Satisfied		0.832
Unhappy – Happy		0.816
Melancholic – Contented		0.797
Despairing – Hopeful		0.706
Bored – Relaxed		0.681
Eigenvalues	5.818	2.331
Variance explained	48.484	19.428
Accumulative variance explained	48.484	67.912

* The scale ranged from *Extremely Negative* (-2) to *Extremely Positive* (+2).

According to results, arousal as the first and pleasure as the second factor were found under blue color scheme. First factor, which was arousal, was the most significant emotional state for blue. In Factor I, the six bipolar adjectives pertained to arousal and the bipolar adjectives of arousal were sluggish – frenzied, sleepy – wide awake, calm – excited, relaxed – stimulated, unaroused – aroused and dull- jittery. The second factor had a lower importance level pertained to pleasure and the bipolar adjectives of pleasure were annoyed – pleased, unsatisfied – satisfied, unhappy – happy, melancholic – contented, despairing – hopeful and bored – relaxed (see Table 13).

In order to find out the most important factors for people's emotional states under warm color scheme (yellow color scheme), first of all, a principal component analysis was performed on the correlations of 12 items. No item was found out below 0.30; all items of the experiment were remained the same.

Secondly, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was investigated. The results showed that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.875 so the value was acceptable to conduct factor analysis for this data set. The 12 items are divided as three different factors. Among the 3 factors, 2 factors had at least 3 items and 1 factor had fewer items; therefore, 2 factors were paid regard to the most important factors (see Appendix J.6). These two factors were counted the 61.884% of the variance. The prioritized 'emotional states' factors and the corresponding loadings of the items on these three factors are demonstrated in Table 14. The factors consisted of only the items with 0.50 or more loading weights.

Table 14. Factor analysis results for yellow color scheme.

	Factor	
	I	II
Pleasure		
Annoyed – Pleased	0.862	
Melancholic – Contented	0.862	
Unhappy – Happy	0.797	
Unsatisfied – Satisfied	0.784	
Bored – Relaxed	0.619	
Arousal		
Sleepy – Wide awake		0.849
Sluggish – Frenzied		0.817
Relaxed – Stimulated		0.791
Unaroused – Aroused		0.604
Calm – Excited		0.562
Eigenvalues	5.951	1.475
Variance explained	49.595	12.289
Accumulative variance explained	49.595	61.884

* The scale ranged from *Extremely Negative* (-2) to *Extremely Positive* (+2).

According to results, pleasure as the first and arousal as the second factor were found prominent under yellow color scheme. Pleasure was the most important emotional state for yellow. In the first factor, the highlight bipolar adjectives belonged to pleasure and the bipolar adjectives of pleasure were annoyed – pleased, melancholic – contented, unhappy – happy, unsatisfied – satisfied and bored – relaxed. The second factor had a lower importance level belonged to arousal and the bipolar adjectives of arousal were sleepy – wide awake, sluggish – frenzied, relaxed – stimulated, unaroused – aroused, and calm – excited (see Table 14).

In order to comprehend the factors for people's emotional states under achromatic color scheme (grey color scheme), a principal component analysis was implemented on the correlations of 12 items of emotional state for achromatic color scheme. No item was found out below 0.30; all items of the experiment were remained the same. Secondly, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was investigated. The result showed that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.893 so the value was acceptable to conduct factor analysis for this data set. The 12 items are divided as two different factors. 2 factors had at least 3 items; thus, two factors were taken account of the most important factors (see Appendix J.6). These two factors were calculated as 71.294% of the variance. The prioritized 'emotional states' factors and the corresponding loadings of the items on these three factors are indicated in Table 15. The factors comprised only the items with 0.50 or more loading weights.

Table 15. Factor analysis results for grey color scheme.

	Factor	
	I	II
Pleasure		
Melancholic – Contented	0.874	
Unhappy – Happy	0.862	
Annoyed – Pleased	0.841	
Unsatisfied – Satisfied	0.833	
Despairing – Hopeful	0.770	
Bored – Relaxed	0.769	
Unaroused – Aroused	0.613	
Arousal		
Sleepy – Wide awake		0.860
Sluggish – Frenzied		0.858
Relaxed – Stimulated		0.800
Dull – Jittery		0.598
Calm – Excited		0.540
Eigenvalues	8.013	2.427
Variance explained	44.516	13.481
Accumulative variance explained	44.516	57.997

* The scale ranged from *Extremely Negative* (-2) to *Extremely Positive* (+2).

According to the results, pleasure as the first and arousal as the second factor were found under grey color scheme. First factor was comprised by all items of pleasure state and only one item of arousal state. Six bipolar adjectives of pleasure were melancholic – contented, unhappy – happy, annoyed – pleased, unsatisfied – satisfied, despairing – hopeful, and bored- relaxed. The highlight bipolar adjective of arousal was unaroused – aroused, which got grouped under first factor (‘pleasure’) also. The second factor had a lower importance level related to arousal only and the highlight five bipolar adjectives of

arousal were sleepy – wide awake, sluggish – frenzied, relaxed – stimulated, dull – jittery, and calm – excited (see Table 116).

Table 16. Items referring to their states of emotion under factors for grey color scheme.

Factor I (*Pleasure & Arousal)*	Factor II *(Arousal)*
Melancholic - Contented Unhappy – Happy Annoyed - Pleased Unsatisfied - Satisfied Despairing - Hopeful Bored – Relaxed Unaroused - Aroused	Sluggish - Frenzied Sleepy - Wide awake Relaxed - Stimulated Dull – Jittery Calm - Excited

*Arousal ; Pleasure

As a result, when the findings of three color schemes were analyzed by Factor Analysis, it can be said that arousal is the prominent emotional state under blue color scheme; pleasure is the prominent emotional state under yellow and grey color schemes in city hotel guestrooms.

5.2. Discussion

In this thesis, the effects of colors on people's emotional states and behavioral intentions and the effect of emotional states on people's behavioral intentions in city hotel guestrooms were examined. It was hypothesized that blue color evokes pleasure and no

arousal, whereas yellow color evokes arousal and displeasure in city hotel guestrooms. Blue color would cause approach behavior, whereas yellow color would cause avoidance behavior in city hotel guestrooms. Grey color was thought to have a neutral effect on pleasure, arousal and behavioral intentions. A positive relationship was assumed between pleasure and approach behavior and between arousal and avoidance behavior in city hotel guestrooms. The differences and relationships in the city hotel guestrooms were analyzed under three colors: blue as a cool color, yellow as a warm color and grey as an achromatic color by taking into consideration people's emotional states (pleasure, arousal), behavioral intentions and their relations.

In the previous studies, by raising satisfaction or quality standards, hospitality managers aimed at touching guests' emotions and enhancing approach behavior to benefit their profits and return to purchase (Ganesh et. al, 2000; Kamdapuly & Suhartanto; 2000). Hotel designers comprehend to meet people's emotional expectation in hotel guestrooms to provide hoteliers with return patronage (Siguaw & Enz, 1999). To satisfy these expectations, visual aspects such as lighting and color in guestrooms are found as a key factor (Suzuki, 2002; Ogle, 2009). Therefore, using appropriate color in hotel guestrooms plays an essential role in meeting expectations of both the guests and the hoteliers according to concept, design and function. Therefore, in this study, it is regarded that the impact of colors in a real world city hotel guestroom could be tested for positive emotions and approach behavior. The findings of the study are evaluated according to these purposes.

The findings indicate some similarities and differences with the literature. In the previous research studies, less attention has been paid to the dominance scale. Russell and Pratt (1980) support that that two emotional states, which are pleasure and arousal, are adequate to indicate people's emotional responses to all types of situations. To overcome this deficiency, this study retains M-R (1974) original tridimensional model and examines to explore if, in fact, the dominance scale plays an essential or unessential role in city hotel guestrooms with regard to the effect of colors on emotional states and behavioral intentions. However, since the reliability level of some of the items in dominance scale were poor, all items in dominance scale for the color gray were regarded as unacceptable. For this reason, the results of gray color could not be used to compare dominance scale with the other colors. Therefore, dominance scale is eliminated from the findings of this study, similar to previous studies which claim that dominance has not a significant influence on people (Russell & Pratt, 1980; Chebat & Michon, 2003; Mattilla & Wirtz, 2006, Pae, 2009; Park et. al., 2010).

First hypotheses (H1a & H1b & H1c) are related with the effect of colors on pleasure state in city hotel guestrooms. According to the previous studies in the literature, it is expected that people's pleasure state changes according to the influence of different color schemes. It is hypothesized that blue evokes pleasantness; yellow evokes displeasure; whereas grey has a neutral effect on people's pleasure state in city hotel rooms. The results indicate that there is a significant difference between the effect of blue, yellow and grey color schemes; however, there is not a significant difference between the effect of blue and yellow color schemes in the city hotel rooms. Both the blue and yellow color schemes are found as pleasant, whereas the grey evoked

displeasure. Therefore, it can be said that touching pleasure state of emotion is dependent of chroma. If the color is a chromatic, pleasantness is revealed in the city hotel guestrooms. On the other hand, if the color is an achromatic, it has a negative effect on pleasure and evokes displeasure. In other words, both yellow and blue colors are comprehended as pleasant colors and can be used to create pleasantness in the city hotel guestrooms.

These results are in line with the previous findings which indicate that cool color environments such as blues and greens are found as pleasant (Bellizzi et. al., 1983; Clarke & Costall, 2008; Hempill, 1996; Kaya & Epps, 2004; Manav, 2007; Sharpe, 1974; Valdez & Mehrabian, 1994; Yıldırım et. al., 2011). Although these studies are conducted in different settings with different methods, blue is generally associated with pleasure in all circumstances. On the other hand, these results are not in line with the previous findings which emphasize that warm colors are associated with lower levels of pleasantness (Ainsworth et. al., 1993; Bellizzi et. al., 1983; Jacobs & Suess, 1975; Kwallek et. al., 1997; Valdez & Mehrabian, 1994) and which state that emotionally grey is shown regard as lacking emotion and evoking pleasantness (Clarke & Costall, 2008; Hempill, 1996; Kaya & Epps, 2004; Valdez & Mehrabian, 1994).

In addition to these results, it is also shown that pleasure is a prominent emotional state in yellow and grey color schemes city hotel guestrooms. Although warm colors are observed as unpleasant in many studies (Ainsworth, et al., 1993; Bellizzi et. al., 1983; Jacobs & Suess, 1975; Kwallek, et. al., 1997; Valdez & Mehrabian, 1994), in a city hotel guestroom yellow color is comprehended as pleasant. The reason why yellow is

observed as pleasant can be related with the type of hotel since yellow is generally used in city hotel guestrooms. If the study is conducted in different hotels that are located on the seaside or mountain, pleasure state of people could be changed in terms of yellow. Moreover, another reason might be related with the seasons since the study is conducted in winter. Therefore, yellow reminds people of summer, sun, hot weather as previous studies (Clarke & Costall, 2008; Manav, 2007). Therefore, if the study is conducted in different season, the result might change. In addition to these, grey color seems to be more related with displeasure; since if the individual mean values are compared, most of items lay on the negative side such as being melancholic, unhappy, unsatisfied, despairing, bored and unaroused. Interestingly grey was also found pleasing to a very limited degree in through the 'pleased' item. Therefore, it can be understood that grey become prominent related with unpleasant items.

Second hypotheses (H2a & H2b & H2c) are focused on the influence of colors on arousal state in city hotel guestrooms. It is hypothesized that blue evokes no arousal; yellow evokes arousal, whereas grey has a neutral effect on people's arousal state in city hotel guestrooms. The findings show that there is a significant difference between the effect of blue, yellow and grey color and there is not a significant difference between the effect of blue and yellow color schemes on people's arousal state in the city hotel room. Thus, it seems that affecting arousal state of emotion is also depended on chroma. However, according to mean results, it is also seen that yellow color scheme reveals arousal, whereas blue is found as too close to either arousal or no arousal. It is also indicated that this is very close to mid-point so does not mean an arousal state but neither aroused nor unaroused state. Grey color scheme reveals no arousal in city hotel

guestrooms. Therefore, it can be seen that warm colors can be preferred for affecting arousal state of emotion on the other hand cool colors can be used to create low arousal in the city hotel guestrooms.

These finding also supports previous researches which demonstrate that emotionally warm colors have been linked with arousal whereas cool colors are prone to reveal lower levels of arousal (Ainsworth, et al., 1993; Cahoon, 1969; Jacobs & Suess, 1975; Kwallek, et. al., 1997; Valdez & Mehrabian, 1994; Yıldırım et. al., 2011). Moreover, the results are different from the achromatic color studies which mention that achromatic colors are considered as lacking emotion neither arousal nor unarousal whereas as in this study grey was associated with unarousal, low arousal state (Clarke & Costall, 2008; Kaya & Epps, 2004; Valdez & Mehrabian, 1994). The reason why the result is different from these studies could be related with the participant groups, cultural background or methods, since Kaya and Epps's (2004) study is conducted with only students and Clarke & Costall's (2008) study is examined in different culture and Valdez & Mehrabian' (1994) study is carried out by using color chips.

In addition to these, it is also observed that arousal is the prominent emotional state in blue color scheme city hotel guestroom. Blue color seems to be between neutral and unarousal, but, if the individual mean values are compared, some of items provide the negative emotions such as calm, dull and relaxed. Curiously blue was also found arousing to a very limited degree in 'arousal' item. Therefore, it can be understood that blue become prominent related with unarousal items because of characteristics such as calm, dull and relaxed as in previous studies (Clarke & Costall, 2008; Hemphill, 1996;

Kaya & Epps, 2004; Manav, 2007; Odom & Sholtz, 2000; Sharpe, 1974; Yıldırım et. al., 2011).

Third hypotheses (H3a & H3b & H3c) posit that blue causes approach behavior; yellow causes avoidance behavior, whereas grey have a neutral effect on people's behavioral intentions in city hotel guestrooms. Contrary to this expectation, the results demonstrate that there is not a significant difference between the effect of blue color scheme and yellow color scheme on people's behavioral intentions. However, there is a significant difference between blue and grey color schemes and yellow and grey color schemes on people's behavioral intentions in city hotel guestrooms. Yellow and blue colors are found to cause approach behavior in city hotel guestrooms, while grey color is found to reveal avoidance behavior. Thus; it is shown that behavioral intentions are based on the effect of chroma. If the color is a chromatic, approach intentions is revealed in the city hotel guestrooms. It means that if people see chromatic colors in a city hotel guestroom, they desire to stay in it, recommend it to their friends and return to this guestroom in the future. On the other hand, if the room has an achromatic color scheme, the emotion of people results in avoidance behavior. People would like to leave from the guestroom, verbally express their disliking for it and do not want to return to this environment. Thus, to provide an approach behavior, chromatic colors should be situated in hotel guestrooms.

The result is analogous to the work of Barlı et al. (2012), Babin et al. (2003), Bellizzi et al. (1983), Bellizzi and Hite (1992) which find that cool color has a positive influence on people's behavioral intentions in terms of desiring to spend more time in the space and

increasing purchase intention. Moreover, the results support the finding of Barlı et al. (2012) and Bellizzi et al.'s (1983) study which states that avoidance behavior is detected in warm color in terms of time spend and purchase intention. On the other hand, the results are not in line with the previous studies which emphasize that approach behavior is seen in settings with warm colors in terms of purchase intention and time spent (Bellizzi & Hite, 1992). Moreover, all results are not analogous with Özmen's (2014) study, which support that colors do not have an effect on people's approach or avoidance behavior. The difference from these results could be due to building type, which is a store.

The last hypotheses (H4a & H4b) are depending on the relationship between the emotional states (pleasure, arousal) and behavioral intentions (approach or avoidance behavior) in city hotel guestrooms. Although previous marketing research demonstrates that there is a positive relationship between the arousal and approach behavior, this study mainly focuses on color in hospitality setting. According to the previous color studies, it is expected that there is a positive relationship between the pleasure and approach and there is a positive relationship between the arousal and avoidance behavior in city hotel guestrooms. Firstly, the results indicate that there is a positive moderate association among pleasure and behavioral intentions under the blue color scheme and among pleasure and behavioral intentions under the yellow color scheme. Moreover, a positive high association among pleasure and behavioral intentions is found under the grey color scheme. It means that while enhancing the pleasure state, the behavioral intentions are significantly increasing in a positive way. In other words, it is noticed that the pleasurable environments enables people with an approach behavior in city hotel

guestrooms under each color scheme. Secondly, the findings also show that there is a positive weak association between arousal and behavioral intentions under the blue color scheme. A positive moderate association is found between pleasure and behavioral intentions under the yellow color scheme and under the grey color scheme. It implies that while increasing the arousal, the approach behavior is increasing as well. Therefore, it can be said that using yellow and blue colors have a positive effect on people's emotional states (pleasure and arousal), which causes approach behavior as in the previous marketing studies.

These results show similarities with past work of Donovan and Rossiter (1982), Baker et al. (1992), Spies et al. (1997), Sherman et al. (1997), Yoo et al. (1998), Wirtz and Bateson (1999), Yalch and Spangenberg (2000), Bitner (1992) and Obermiller and Bitner (1984) who have presented that pleasant environments in marketing provide customers with a positive effect on approach behavior. Moreover, these are similar to the past work which claims that environmental stimuli which cause arousal emotion are also demonstrated to be related with increasing the approach behavior (Baker et. al., 1992). On the other hand, the results are not line with some past color studies, which refer that warm colors cause arousal related to avoidance behavior (Barlı et. al., 2012; Bellizzi et.al., 1983; Bellizzi & Hite, 1992). It can be briefly said that in some color studies arousal state is perceived as a negative emotion in terms of causing avoidance behavior. The results demonstrate that in hotel guestrooms arousal is not comprehended as a negative emotion. Thus, it can be understood that no matter pleasure or arousal when the emotional state increases in the hotel guestroom, approach behavior is revealed.

In addition to all these hypotheses, itemized analysis firstly demonstrate that the feelings of relaxed, hopeful, happy, contented, pleased, satisfied, calm, dull, aroused, wide awake and frenzied are evoked in the blue color scheme city hotel guestrooms. Secondly, it was shown that the feeling of relaxed, hopeful, happy, contented, pleased, satisfied, dull, excited, aroused, wide awake and frenzied revealed in yellow color scheme city hotel guestrooms. Lastly, it was indicated that the feelings of bored, despairing, unhappy, melancholic, unsatisfied, pleased, calm, unaroused, dull, relaxed, sleepy and sluggish are revealed in grey color scheme city hotel guestrooms. These results also bear a resemblance to the past studies which assert that cool colors have been linked with terms as calm, restful, peaceful, pleased, hope, happiness, comfort and peace (Sharpe, 1974; Valdez & Mehrabian, 1994; Odom & Sholtz, 2000; Kaya & Epps, 2004; Manav, 2007; Clarke & Costall, 2008; Suk & Irtel, 2009). Moreover, the results are also analogous with the past studies which refer that emotionally warm colors have been linked with the feeling of elated mood, arousal, cheerfulness, enjoyment, excitement and dynamism (Schaie & Heiss, 1964; Cahoon, 1969; Valdez & Mehrabian, 1994; Odom & Sholtz, 2000; Kaya & Epps, 2004; Manav, 2007; Clarke & Costall, 2008) On the other hand, the results are not line with the studies related to achromatic colors which claim that achromatic colors like grey are considered as lacking emotion (Valdez & Mehrabian, 1994; Clarke & Costall, 2008). As a result, it can be said that all studies are conducted in different settings with different methods; the results show similarities due to characteristic of colors.

According to all these results, the findings of the study, rejecting or not rejecting hypotheses and references with in-line and not in-line results are indicated in Table 13 as a summary.

Table 17: Summary of the findings of the study.

Hypothesis	Findings of the study	Reject Hypothesis	Do not reject Hypothesis	References with in-line	References with not in-line
H1a.	Blue evokes pleasantness.		+	Bellizzi et. al.,1983; Clarke & Costall, 2008; Hempill, 1996; Kaya & Epps, 2004; Manav, 2007; Sharpe, 1974; Valdez & Mehrabian, 1994; Yıldırım et. al., 2011	
H1b.	Yellow evokes pleasantness.	+			Ainsworth, et al., 1993; Bellizzi et. al., 1983; Jacobs & Suess, 1975; Kwallek, et. al., 1997; Valdez & Mehrabian, 1994
H1c.	Gray evokes displeasure.	+			Clarke & Costall, 2008; Hempill, 1996; Kaya & Epps, 2004; Valdez & Mehrabian, 1994
H2a.	Blue is found as too close to either arousal or no arousal.	+		Ainsworth, et al., 1993; Cahoon, 1969; Jacobs & Suess, 1975; Kwallek, et. al., 1997; Valdez & Mehrabian, 1994; Yıldırım et. al., 2011	
H2b.	Yellow evokes arousal.		+	Ainsworth, et al., 1993; Cahoon, 1969; Jacobs & Suess, 1975; Kwallek, et. al., 1997; Valdez & Mehrabian, 1994; Yıldırım et. al., 2011	
H2c.	Gray evokes unarousal.	+			Clarke & Costall, 2008; Kaya & Epps, 2004; Valdez & Mehrabian, 1994
H3a.	Blue causes approach behavior.		+	Barlı et al., 2012; Bellizzi et al., 1983; Bellizzi & Hite, 1992; Babin et. al., 2003	Özmen, 2014

Table 17 (cont'd)

H3b.	Yellow causes approach behavior.	+		Bellizzi & Hite, 1992	Özmen,2014 Barlı et. al., 2005; Bellizzi et. al., 1983
H3c.	Gray causes avoidance behavior.	+			Özmen, 2014
H4a.	There is a positive relationship between pleasure and approach behavior.		+	Donovan & Rossiter, 1982; Baker et.al, 1992; Spies et. al., 1997; Sherman et. al., 1997; Yoo et. al., 1998; Wirtz & Bateson, 1999; Yalch & Spangenberg, 2000; Bitner, 1992; Obermiller & Bitner, 1984	Baker et. al., 1992
H4b.	There is a positive relationship between yellow and approach behavior.	+			Barlı et. al., 2012; Bellizzi et.al., 1983; Bellizzi & Hite, 1992

CHAPTER VI

CONCLUSION

The effects of colors on people's emotional states (pleasure, arousal) and behavioral intentions and the effect of emotional states (pleasure, arousal) on behavioral intentions (approach or avoidance behavior) are explored in an executive hotel guestroom of Sentido Marina Suits in Kuşadası. The results of the statistical analysis of this study indicate that blue and yellow colors are found as pleasant, whereas the grey evokes displeasure in city hotel guestrooms. Yellow color scheme reveal arousal, whereas blue is found as too close to either arousal or nonarousal, however, it is approximately nonarousal because of the characteristics of blue color like being calm, unaroused, relaxed and sleepy. Grey color scheme reveals nonarousal in city hotel guestrooms. Blue and yellow colors are found to cause approach behavior in city hotel guestrooms, while gray color is found to reveal avoidance behavior. Moreover, there is a positive relationship between pleasure and approach behavior and between arousal and approach behavior.

This study is important as there are not any studies combining color, emotion and behavioral intentions in a hospitality context. In other words, there are not any research

done on the influence of colors on people's emotional states and behavioral intentions in real world city hotel guestrooms. Thus, the results of this study play an essential role in filling the gap in the literature about the effects of color in hospitality context.

The results of this study can be useful for interior architects, designers and hoteliers who put emphasis on touching guests' emotions and approach behavior in terms of loyalty to enhance their profits and return to purchase by creating expected or liked color scheme. It is also significant to know the influence of colors on people's emotional states and behavioral intentions in city hotel guestrooms since color is a key factor to create an atmosphere in city hotel guestrooms. In addition to these, the results of this study can be useful not only interior architects, designers and hoteliers, but also for managers and environmental psychologist who interested in hotel environments, hospitality settings, guests' emotions and behavioral intentions.

This study is conducted in a real city hotel guestroom with real population under the same conditions except from changing color schemes of the room. One limitation for this research is related with the hotel's location and type. The findings of the research might be strengthened by having a wider representative of rooms and hotel types throughout the country or even in different countries. Since color influence and use can change according to location and culture. Another limitation of this research is related to having only blue as a cool, yellow as a warm, and grey as an achromatic color. Thus the study could not generalize the findings for cool, warm and achromatic colors. More colors are needed to make a generalization for all cool and warm colors. Nevertheless, according to the literature and real life application, both colors (yellow and blue) are

widely used. Thus, the findings are still valuable in order to have general idea for warm and cool colors.

In future studies, a similar experiment can be executed in different city hotels in different cities by comparing different city hotels with more colors. In addition to these, the effects of colors different than the ones used in this experiment can be researched such as green, red and black or white and more in order to achieve a wider spectrum of color schemes. Additionally, in further researches, whether there are demographic effects such as age, gender, and culture on the assessment of the effects of different color schemes on people's emotional states and behavioral intentions in city hotel guestrooms can also be investigated.

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APPENDICES

APPENDIX A

DEMOGRAPHIC INFORMATION OF THE SAMPLE GROUP

APPENDIX A. Demographic information of participants after elimination.

Table 18. Characteristics of the participants (n=273).

Characteristic		**n**	**%**
Gender	Male	111	40.7
	Female	162	59.3
Age	18-25	46	16.8
	26-35	78	28.6
	36-45	50	18.3
	46-5	62	22.7
	56-65	37	13.6
Educational Background	Primary School	20	7.3
	High School	77	28.2
	University	151	55.3
	Master – PhDs	25	9.2
Hotel visiting a year	1-3/ year	140	51.3
	4-6/ year	51	18.7
	7-9/ year	36	13.2
	More than 9/ year	46	16.8
Eye or vision deficiencies	Yes	110	40.3
	No	163	59.7
Correction Equipment	Yes	110	40.3
	No	163	59.7
Color courses during education	No	273	100.0
Work as a professional related to color	No	273	100.0
Color blind	No	273	100.0

APPENDIX B

QUESTIONNAIRE

APPENDIX B.1. Questionnaire (in Turkish).

ANKET

Bu otel odasında konaklayacaksınız. Odayı vereceğimiz ankete göre değerlendirebilirseniz çok seviniriz. Anketi doldurmanız yaklaşık 5 dakikanızı alacaktır. Bu çalışmada doğru veya yanlış cevap yoktur. Anketteki tüm soruları size en uygun seçeneğe denk gelen kutucuğu işaretleyerek cevaplayınız. Katılımınız için çok teşekkür ederiz.

A. DEMOGRAFİK BİLGİLER

Aşağıdaki soruları sizin için en uygun olan şekilde cevaplayınız.

1. Adınız, Soyadınız:
2. Cinsiyet: E ☐ K ☐
3. Yaşınız: <18 ☐ 18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 65< ☐
4. Eğitim Seviyesi: İlköğrenim ☐ Ortaöğrenim *(Lise)* ☐ Yükseköğrenim *(Üniversite)* ☐ Lisansüstü *(Master- Doktora)* ☐
5. Bir yılda, ne sıklıkla otelde kalıyorsunuz?
   Hiç ☐ 1-3/yıl ☐ 4-6/yıl ☐ 7-9/yıl ☐ 9'dan fazla/yıl ☐
6. Herhangi bir göz bozukluğunuz var mı?
   Evet ☐ Hayır ☐
7. Bu göz bozukluğunuzu giderecek herhangi bir araç (lens, gözlük, vb. gibi) kullanıyor musunuz?
   Evet ☐ Hayır ☐

   7.1. Eğer evetse, bu araç şu an üzerinizde mi?
   Evet ☐ Hayır ☐
8. Eğitim hayatınız süresince dolaylı da olsa renk ile ilgili bir eğitim ya da ders aldınız mı?
   Evet ☐ Hayır ☐
9. Eğitim kurumları haricinde bir yerde renk ile ilgili deneyim elde etmek için profesyonel olarak çalıştınız mı?
   Evet ☐ Hayır ☐
10. Renk görme kusuru (**Ishihara Renk Körlüğü Testi**)
    Var ☐ Yok ☐

B. RUH HALİ

Lütfen bu odanın renk şemasına göre hislerinizi derecelendiriniz.

MEMNUNİYET						
Sıkıcı	☐	☐	☐	☐	☐	Eğlenceli
Umutsuz	☐	☐	☐	☐	☐	Umutlu
Mutsuz	☐	☐	☐	☐	☐	Mutlu
Üzüntülü	☐	☐	☐	☐	☐	Memnun
Rahatsız	☐	☐	☐	☐	☐	Rahat
Keyifsiz	☐	☐	☐	☐	☐	Keyifli

UYARILMA						
Sakin	☐	☐	☐	☐	☐	Heyecanlı
Hissiz	☐	☐	☐	☐	☐	Aşırı Hisli
Donuk	☐	☐	☐	☐	☐	Gergin
Uyuşuk	☐	☐	☐	☐	☐	Uyarılmış
Uykulu	☐	☐	☐	☐	☐	Canlı
Tembel	☐	☐	☐	☐	☐	Coşkulu

HAKİMİYET						
Rahat	☐	☐	☐	☐	☐	Baskı altında
İlgilenilmiş	☐	☐	☐	☐	☐	Denetim altında
Yönlendirilmiş	☐	☐	☐	☐	☐	Özgür
Etkileyen	☐	☐	☐	☐	☐	Etkilenen
Kontrol altına alınmış	☐	☐	☐	☐	☐	Kontrol eden
Huşu/ Görkem	☐	☐	☐	☐	☐	Önemli

C. DAVRANIŞ EĞİLİMİ

Aşağıdaki cümleleri odanın renk şemasını göz önünde bulundurarak değerlendiriniz.

	Hiç Katılmıyorum				**Tamamen Katılıyorum**
Bu otel odasını arkadaşlarıma önereceğim.	☐	☐	☐	☐	☐
İleride bu otel odasına tekrar geleceğim.	☐	☐	☐	☐	☐
Bu otel odasında planladığımdan daha fazla vakit geçirmek için hevesliyim.	☐	☐	☐	☐	☐

ANKET HAKKINDA BİLGİ

Bu anket Bilkent Üniversitesi, İç Mimarlık ve Çevre Tasarımı Bölümü bünyesindeki 'Otel Odalarında Renk, His ve Davranış Eğilimleri' konulu bir yüksek lisans tezine veri toplamak amacı ile hazırlanmıştır.

Anket sonuçlarından bilimsel veriler elde edileceği için, görüşleriniz bu çalışma için önem taşımaktadır. Her kişisel demografik bilgi sadece sizin cevaplarınızın diğer katılımcılarınkiyle karşılaştırılması için kullanılacaktır.

Eğer bu araştırma projesi ile ilgili sorularınız olursa, lütfen (312)290 1663 nolu telefondan Yüksek Lisans Öğrencisi Selin Yar [(312) 290 1663 – selin.yar@bilkent.edu.tr] ve Doçent Doktor Nilgün Camgöz Olguntürk [(312) 290 1465 – onilgun@bilkent.edu.tr] ile irtibat kurmaya çekinmeyin.

KATILIMINIZ İÇİN TEŞEKKÜR EDERİZ.

Araştırmacının Adı: Selin Yar
Yer: Sentido Marina Suites, Kuşadası, Türkiye
Tarih:

APPENDIX B.2. Questionnaire (in English).

QUESTIONNAIRE

You will stay in this hotel room. We would appreciate it if you could evaluate rooms according to the survey will give. It will take approximately 5 minutes to complete the questionnaire. There is no true or wrong answer in this questionnaire. Answer you all questions in the questionnaire by ticking the box corresponding to the most appropriate option. Thank you for your participation.

A.DEMOGRAPHIC INFORMATION

Answer the questions appropriate to your situation

1. Given name, Family name:
2. Gender: M ☐ F ☐
3. Age: <18 ☐ 18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 65< ☐
4. Educational Background: Primary Education ☐ Secondary Education *(High School)* ☐ Higher Education *(University)* ☐ Graduate Education *(Masters- Ph.D.)* ☐
5. How often do you stay in a hotel per year?

   None ☐ 1-3/year ☐ 4-6/year ☐ 7-9/year ☐ More than 9/year ☐
6. Do you have any eye or vision deficiencies?

   Yes ☐ No ☐
7. Do you use any correction equipment (contact lenses, eyeglasses, etc.) for any eye or vision deficiency you have?

   Yes ☐ No ☐

   7.1. If yes, are you wearing them at the moment?

   Yes ☐ No ☐
8. Have you had any courses or training related to color during your education?

   Yes ☐ No ☐
9. Have you worked as a professional to gain knowledge of color outside educational institutes?

   Yes ☐ No ☐
10. Color Deficiency (**Ishihara's Test for Color Blindness)**

    Has ☐ Has not ☐

B. EMOTIONAL STATES

Please rate your feeling to color scheme of this room.

PLEASURE						
Bored	☐	☐	☐	☐	☐	Relaxed
Despairing	☐	☐	☐	☐	☐	Hopeful
Unhappy	☐	☐	☐	☐	☐	Happy
Melancholic	☐	☐	☐	☐	☐	Contented
Annoyed	☐	☐	☐	☐	☐	Pleased
Unsatisfied	☐	☐	☐	☐	☐	Satisfied

AROUSAL						
Calm	☐	☐	☐	☐	☐	Excited
Unaroused	☐	☐	☐	☐	☐	Aroused
Dull	☐	☐	☐	☐	☐	Jittery
Relaxed	☐	☐	☐	☐	☐	Stimulated
Sleepy	☐	☐	☐	☐	☐	Wide awake
Sluggish	☐	☐	☐	☐	☐	Frenzied

DOMINANCE						
Submissive	☐	☐	☐	☐	☐	Dominant
Cared for	☐	☐	☐	☐	☐	In control
Guided	☐	☐	☐	☐	☐	Autonomous
Influenced	☐	☐	☐	☐	☐	Influential
Controlled	☐	☐	☐	☐	☐	Controlling
Awed	☐	☐	☐	☐	☐	Important

C. BEHAVIORAL INTENTION

Considering the color scheme of this room, please evaluate the following statements.

	Extremely Disagree				**Extremely Agree**
I will recommend this hotel guestroom to my friends.	☐	☐	☐	☐	☐
I will come to this hotel guestroom in the future.	☐	☐	☐	☐	☐
I am willing to spend more time than I planned at this hotel guestroom.	☐	☐	☐	☐	☐

INFORMATION ABOUT THE STUDY

This questionnaire is designed to obtain date for a Master Thesis entitled ‘Color, Emotion and Behavioral Intention in City Hotel Guestrooms’ prepared at Bilkent University, Department of Interior Architecture and Environmental Design.

Responses to this questionnaire are analyzed as scientific data, for this your responses are important for this experiment. Any personal demographic information will only be used to compare your answer to other participants.

If you have any questions about this research project, please feel free to contact with Selin Yar, Graduate Student at (312) 290 1663 (selin.yar@bilkent.edu.tr) Nilgün Camgöz Olguntürk, Associate Professor Doktor, Department of Interior Architecture and Environmental Design at (312) 290 1465 (onilgun@bilkent.edu.tr).

THANK YOU FOR YOUR PARTICIPATION.

Name of the researcher: Selin Yar
Location: Sentido Marina Suits, Kuşadası, Turkey
Date:

APPENDIX C

ISHIHARA'S COLOR BLINDNESS TEST

APPENDIX C. Ishihara's Color Blindness Test

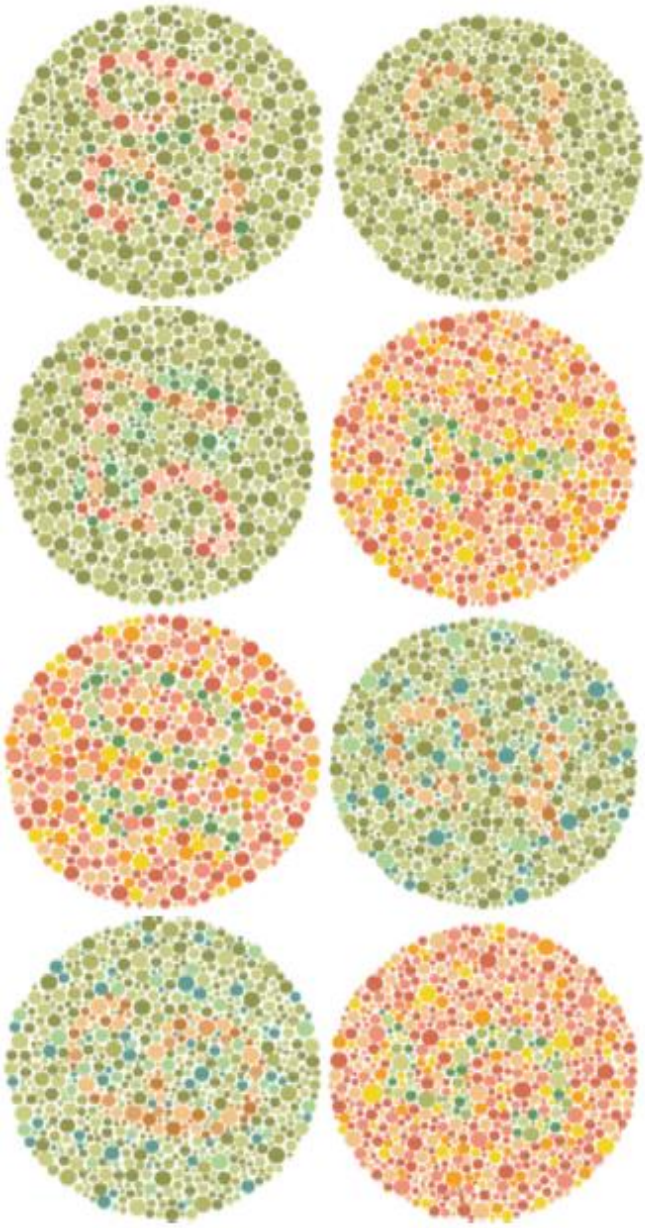

Figure 33. Ishihara's color blindness test.

Ishihara, Shinobu. *Ishihara's Tests for Colour-Blindness*. Concise ed. Tokyo: Kanehara Shuppan Co., 1975)

APPENDIX D

CITY HOTEL GUESTROOM EXAMPLES IN DIFFERENT COUNTRIES

(FROM BOOKING.COM)

APPENDIX D.1. Samples from Cool Color Sample City Hotel Guestrooms

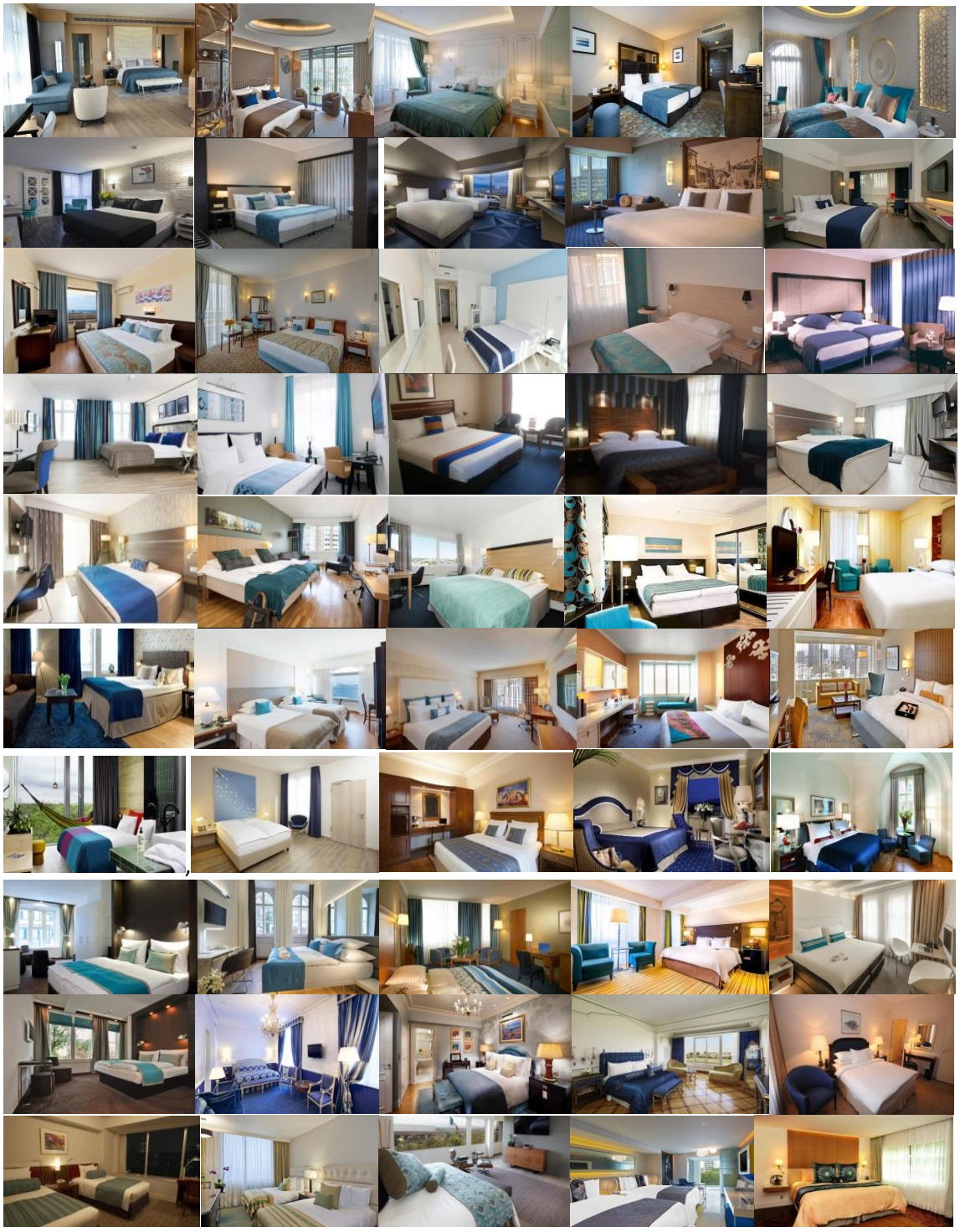

Figure 34. Examples from selected cool color hotel guestrooms (college by Selin Yar, retrieved December 3-4, 2016 from *Booking.com*).

APPENDIX D.2. Samples from Warm Color Sample City Hotel Guestrooms

Figure 35. Examples from selected warm color hotel guestrooms (college by Selin Yar, retrieved December 4-5, 2016 from *Booking.com*).

APPENDIX E

EXAMPLE OF STUDIED FABRIC SWATCHES

APPENDIX E. Example of Studied Fabric Swatches from Different Companies

Figure 36. Example of studied fabric swatches from different companies (collage by Selin Yar).

APPENDIX F

PHOTOGRAPHS OF THE EXPERIMENT SETTING

APPENDIX F. Photographs of the Experiment Setting.

Figure 37. Experimental guestroom from the view 1.

Figure 38. Experimental guestroom from the view 2.

Figure 39. Experimental guestroom from the view 3.

Figure 40. Experimental guestroom from the view 4.

APPENDIX G

PHOTOGRAPHS OF THE EXPERIMENT SETTING HAVING BLUE, YELLOW, GREY COLOR SCHEME

APPENDIX G.1. Photographs of the Experiment Setting Having Blue Color Scheme.

Figure 41. Experimental room having blue color scheme from the view 1.

Figure 42. Experimental room having blue color scheme from the view 2.

Figure 43. Experimental room having blue color scheme from the view 3.

Figure 44. Experimental room having blue color scheme from the view 4.

APPENDIX G.2. Photographs of the Experiment Setting Having Yellow Color Scheme.

Figure 45. Experimental room having yellow color scheme from the view 1.

Figure 46. Experimental room having yellow color scheme from the view 2.

Figure 47. Experimental room having yellow color scheme from the view 3.

Figure 48. Experimental room having yellow color scheme from the view 4.

APPENDIX G.3. Photographs of the Experiment Setting Having Grey Color Scheme.

Figure 49. Experimental room having grey color scheme from the view 1.

Figure 50. Experimental room having grey color scheme from the view 2.

Figure 51. Experimental room having grey color scheme from the view 3.

Figure 52. Experimental room having grey color scheme from the view 4.

APPENDIX H

EXAMPLE PARTICIPANTS IN THE EXPERIMENT SETTING HAVING BLUE, YELLOW, GREY COLOR SCHEME

APPENDIX H.1. Participants in the Experiment Setting Having Blue Color Scheme.

Figure 53. Example participants in the experiment setting having blue color scheme 1.

Figure 54. Example participants in the experiment setting having blue color scheme 2.

APPENDIX H.2. Participants in the Experiment Setting Having Yellow Color Scheme

Figure 55. Example participants in the experiment setting having yellow color scheme 1.

Figure 56. Example participants in the experiment setting having yellow color scheme 2.

APPENDIX H.3. Participants in the Experiment Setting Having Grey Color Scheme.

Figure 57. Example participants in the experiment setting having grey color scheme 1.

Figure 58. Example participants in the experiment setting having grey color scheme 2.

Figure 59. Example participants in the experiment setting having grey color scheme 3.

APPENDIX I

RAW DATA

APPENDIX I.1. Raw Data for All Colors.

Table 19. Raw data of pleasure state for all color schemes.

PLEASURE						
Bored	**37**	**44**	**48**	**109**	**35**	Relaxed
Despairing	**35**	**37**	**93**	**81**	**47**	Hopeful
Unhappy	**26**	**35**	**38**	**86**	**88**	Happy
Melancholic	**17**	**39**	**38**	**79**	**100**	Contented
Annoyed	**22**	**29**	**28**	**67**	**127**	Pleased
Unsatisfied	**30**	**33**	**37**	**72**	**101**	Satisfied

Table 20. Raw data of arousal state for all color schemes.

AROUSAL						
Calm	**59**	**80**	**40**	**72**	**22**	Excited
Unaroused	**32**	**51**	**100**	**66**	**24**	Aroused
Dull	**36**	**61**	**137**	**24**	**15**	Jittery
Relaxed	**30**	**66**	**93**	**58**	**26**	Stimulated
Sleepy	**30**	**68**	**60**	**70**	**45**	Wide awake
Sluggish	**28**	**58**	**85**	**61**	**41**	Frenzied

Table 21. Raw data of dominance state for all color schemes.

DOMINANCE						
Submissive	**74**	**86**	**64**	**36**	**13**	Dominant
Cared for	**66**	**57**	**93**	**38**	**19**	In control
Guided	**45**	**66**	**89**	**46**	**27**	Autonomous
Influenced	**52**	**93**	**76**	**36**	**16**	Influential
Controlled	**47**	**93**	**73**	**40**	**20**	Controlling
Awed	**27**	**44**	**134**	**51**	**17**	Important

Table 22. Raw data of behavioral intentions for all color schemes.

	Extremely Disagree				**Extremely Agree**
I will recommend this hotel guestroom to my friends.	**42**	**35**	**20**	**81**	**95**
I will come to this hotel guestroom in the future.	**42**	**34**	**32**	**76**	**89**
I am willing to spend more time than I planned at this hotel guestroom.	**54**	**33**	**38**	**83**	**65**

APPENDIX I.2. Raw Data for Blue Color Scheme.

Table 23. Raw data of pleasure state for blue color scheme.

PLEASURE						
Bored	**7**	**13**	**17**	**40**	**14**	Relaxed
Despairing	**2**	**9**	**30**	**29**	**21**	Hopeful
Unhappy	**1**	**9**	**8**	**33**	**40**	Happy
Melancholic	**3**	**4**	**13**	**31**	**40**	Contented
Annoyed	**1**	**4**	**10**	**23**	**53**	Pleased
Unsatisfied	**4**	**6**	**13**	**26**	**42**	Satisfied

Table 24. Raw data of arousal state for blue color scheme.

AROUSAL						
Calm	**20**	**27**	**12**	**23**	**9**	Excited
Unaroused	**5**	**21**	**35**	**20**	**10**	Aroused
Dull	**10**	**17**	**46**	**9**	**9**	Jittery
Relaxed	**9**	**23**	**33**	**12**	**14**	Stimulated
Sleepy	**11**	**22**	**22**	**15**	**21**	Wide awake
Sluggish	**8**	**24**	**25**	**17**	**17**	Frenzied

Table 25. Raw data of dominance state for blue color scheme.

DOMINANCE						
Submissive	**32**	**27**	**22**	**9**	**1**	Dominant
Cared for	**28**	**15**	**31**	**11**	**6**	In control
Guided	**21**	**19**	**33**	**9**	**9**	Autonomous
Influenced	**20**	**30**	**25**	**11**	**5**	Influential
Controlled	**22**	**26**	**24**	**16**	**3**	Controlling
Awed	**12**	**18**	**38**	**16**	**7**	Important

Table 26. Raw data of behavioral intentions for blue color scheme.

	Extremely Disagree				**Extremely Agree**
I will recommend this hotel guestroom to my friends.	**8**	**6**	**7**	**36**	**34**
I will come to this hotel guestroom in the future.	**7**	**7**	**15**	**28**	**34**
I am willing to spend more time than I planned at this hotel guestroom.	**13**	**7**	**15**	**33**	**23**

APPENDIX I.3. Raw Data for Yellow Color Scheme.

Table 27. Raw data of pleasure state for yellow color scheme.

PLEASURE						
Bored	**4**	**10**	**14**	**54**	**10**	Relaxed
Despairing	**2**	**9**	**29**	**40**	**12**	Hopeful
Unhappy	**4**	**8**	**5**	**41**	**34**	Happy
Melancholic	**1**	**5**	**10**	**31**	**45**	Contented
Annoyed	**3**	**4**	**3**	**30**	**52**	Pleased
Unsatisfied	**5**	**2**	**6**	**34**	**45**	Satisfied

Table 28. Raw data of arousal state for yellow color scheme.

AROUSAL						
Calm	**12**	**25**	**12**	**37**	**6**	Excited
Unaroused	**2**	**10**	**42**	**33**	**5**	Aroused
Dull	**4**	**19**	**58**	**8**	**3**	Jittery
Relaxed	**1**	**19**	**34**	**31**	**7**	Stimulated
Sleepy	**2**	**16**	**16**	**43**	**15**	Wide awake
Sluggish	**2**	**12**	**31**	**34**	**13**	Frenzied

Table 29. Raw data of dominance state for yellow color scheme.

DOMINANCE						
Submissive	**19**	**44**	**19**	**7**	**3**	Dominant
Cared for	**15**	**28**	**35**	**9**	**5**	In control
Guided	**10**	**21**	**31**	**25**	**5**	Autonomous
Influenced	**12**	**41**	**25**	**12**	**2**	Influential
Controlled	**13**	**43**	**20**	**43**	**15**	Controlling
Awed	**8**	**14**	**44**	**24**	**2**	Important

Table 30. Raw data of behavioral intentions for yellow color scheme.

	Extremely Disagree				**Extremely Agree**
I will recommend this hotel guestroom to my friends.	**5**	**4**	**5**	**33**	**45**
I will come to this hotel guestroom in the future.	**5**	**3**	**6**	**37**	**41**
I am willing to spend more time than I planned at this hotel guestroom.	**5**	**9**	**10**	**34**	**34**

APPENDIX I.4. Raw Data for Grey Color Scheme.

Table 31. Raw data of pleasure state for grey color scheme.

PLEASURE						
Bored	**26**	**21**	**17**	**15**	**11**	Relaxed
Despairing	**11**	**19**	**34**	**12**	**14**	Hopeful
Unhappy	**21**	**18**	**25**	**12**	**14**	Happy
Melancholic	**13**	**30**	**15**	**17**	**15**	Contented
Annoyed	**18**	**21**	**15**	**14**	**22**	Pleased
Unsatisfied	**21**	**25**	**18**	**12**	**14**	Satisfied

Table 32. Raw data of arousal state for grey color scheme.

AROUSAL						
Calm	**27**	**28**	**16**	**12**	**7**	Excited
Unaroused	**25**	**20**	**23**	**13**	**9**	Aroused
Dull	**22**	**25**	**33**	**7**	**3**	Jittery
Relaxed	**20**	**24**	**26**	**15**	**5**	Stimulated
Sleepy	**17**	**30**	**22**	**12**	**9**	Wide awake
Sluggish	**18**	**22**	**29**	**10**	**11**	Frenzied

Table 33. Raw data of dominance state for grey color scheme.

DOMINANCE						
Submissive	**23**	**15**	**23**	**20**	**9**	Dominant
Cared for	**23**	**14**	**27**	**18**	**8**	In control
Guided	**14**	**26**	**25**	**12**	**13**	Autonomous
Influenced	**20**	**22**	**26**	**13**	**9**	Influential
Controlled	**14**	**24**	**29**	**10**	**13**	Controlling
Awed	**7**	**12**	**52**	**11**	**8**	Important

Table 34. Raw data of behavioral intentions for grey color scheme.

	Extremely Disagree				**Extremely Agree**
I will recommend this hotel guestroom to my friends.	**29**	**25**	**8**	**12**	**16**
I will come to this hotel guestroom in the future.	**30**	**24**	**11**	**11**	**14**
I am willing to spend more time than I planned at this hotel guestroom.	**36**	**17**	**13**	**16**	**8**

APPENDIX J

STATISTICAL ANALYSIS

APPENDIX J.1. Crombach's Alpha Values of Dominance

Table 35. Crombach's alpha values of dominance scale.

Group		Cronbach's Alpha if Item Deleted
Blue	Submissive - Dominant	.744
	Cared for - In control	.710
	Guided - Autonomous	.756
	Influenced - Influential	.690
	Controlled - Controlling	.696
	Awed – Important	.747
	DOMINANCE	.760
Yellow	Submissive - Dominant	.765
	Cared for - In control	.711
	Guided - Autonomous	.708
	Influenced - Influential	.691
	Controlled - Controlling	.721
	Awed – Important	.732
	DOMINANCE	.757
Grey	Submissive - Dominant	.594
	Cared for - In control	.590
	Guided - Autonomous	.573
	Influenced - Influential	.477
	Controlled - Controlling	.515
	Awed – Important	.483
	DOMINANCE	.585

APPENDIX J.2. Tests of Normality

Table 36. Normality test results.

Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PLEASURE	Blue	.148	91	.000	.918	91	.000
	Yellow	.230	92	.000	.856	92	.000
	Grey	.151	90	.000	.938	90	.000
AROUSAL	Blue	.147	91	.000	.959	91	.006
	Yellow	.081	92	.174	.983	92	.266
	Grey	.112	90	.007	.956	90	.004
EMOTIONAL STATES	Blue	.089	91	.069	.968	91	.023
	Yellow	.109	92	.009	.941	92	.000
	Grey	.139	90	.000	.958	90	.005
BEHAVIORAL INTENTION	Blue	.169	91	.000	.872	91	.000
	Yellow	.218	92	.000	.816	92	.000
	Grey	.153	90	.000	.875	90	.000

a. Lilliefors Significance Correction

APPENDIX J.3. Kruskall – Wallis H Test

Table 37. Kruskal-Wallis H test results for pleasure, arousal, emotional states and behavioral intentions.

		Group						Kruskall-Wallis H test		
		n	Mean	Median	Minimum	Maximum	ss	Mean Rank	H	p
Pleasure	Blue	91	,95	1,17	-1,67	2,00	,85	159,06	51,302	0,0001
	Yellow	92	1,00	1,17	-2,00	2,00	,81	162,77		
	Grey	90	-,17	-,50	-2,00	2,00	1,21	88,36		
Arousal	Blue	91	-,01	-,33	-2,00	2,00	,98	139,35	30,027	0,0001
	Yellow	92	,25	,33	-2,00	1,83	,70	167,43		
	Grey	90	-,46	-,50	-2,00	1,83	,94	103,52		
Emotional states	Blue	91	,47	,42	-1,50	2,00	,78	148,81	46,950	0,0001
	Yellow	92	,62	,75	-1,50	1,92	,68	169,42		
	Grey	90	-,32	-,50	-2,00	1,92	1,01	91,92		
Behavioral intentıon	Blue	91	3,74	4,00	1,00	5,00	1,18	151,19	59,019	0,0001
	Yellow	92	4,08	4,33	1,00	5,00	,99	172,40		
	Grey	90	2,48	2,00	1,00	5,00	1,37	86,47		

Table 38. Kruskal-Wallis H test Results for all items of emotional states.

		Group						Kruskall-Wallis H test		
		n	Mean	Median	Minimum	Maximum	ss	Mean Rank	H	p
Bored - Relaxed	Blue	91	,45	1,00	-2,00	2,00	1,15	149,93	30,522	0,0001
	Yellow	92	,61	1,00	-2,00	2,00	,97	159,17		
	Grey	90	-,40	-1,00	-2,00	2,00	1,38	101,26		
Despairing - Hopeful	Blue	91	,64	1,00	-2,00	2,00	1,02	153,14	18,102	0,0001
	Yellow	92	,55	1,00	-2,00	2,00	,92	148,18		
	Grey	90	-,01	0,00	-2,00	2,00	1,21	109,24		
Unhappy - Happy	Blue	91	1,12	1,00	-2,00	2,00	1,01	164,13	53,749	0,0001
	Yellow	92	1,01	1,00	-2,00	2,00	1,08	157,11		
	Grey	90	-,22	0,00	-2,00	2,00	1,36	89,01		
Melancholic - Contented	Blue	91	1,11	1,00	-2,00	2,00	1,03	156,60	54,930	0,0001
	Yellow	92	1,24	1,00	-2,00	2,00	,93	164,79		
	Grey	90	-,10	0,00	-2,00	2,00	1,33	88,78		
Annoyed - Pleased	Blue	91	1,35	2,00	-2,00	2,00	,92	159,82	52,227	0,0001
	Yellow	92	1,35	2,00	-2,00	2,00	,98	159,66		
	Grey	90	,01	0,00	-2,00	2,00	1,48	90,76		
Unsatisfied - Satisfied	Blue	91	1,05	1,00	-2,00	2,00	1,13	157,42	61,316	0,0001
	Yellow	92	1,22	1,00	-2,00	2,00	1,05	166,73		
	Grey	90	-,30	-1,00	-2,00	2,00	1,38	85,96		
Calm – Excited	Blue	91	-,29	-1,00	-2,00	2,00	1,33	137,58	11,235	0,0001
	Yellow	92	,00	0,00	-2,00	2,00	1,21	155,54		
	Grey	90	-,62	-1,00	-2,00	2,00	1,26	117,46		
Unaroused - Aroused	Blue	91	,10	0,00	-2,00	2,00	1,05	141,96	20,612	0,0001
	Yellow	92	,32	0,00	-2,00	2,00	,82	159,48		
	Grey	90	-,43	-,50	-2,00	2,00	1,31	109,01		
Dull - Jittery	Blue	91	-,11	0,00	-2,00	2,00	1,06	149,15	15,617	0,0001
	Yellow	92	-,14	0,00	-2,00	2,00	,76	149,40		
	Grey	90	-,62	-1,00	-2,00	2,00	1,04	112,04		
Relaxed - Stimulated	Blue	91	-,01	0,00	-2,00	2,00	1,19	138,33	17,291	0,0001
	Yellow	92	,26	0,00	-2,00	2,00	,91	159,58		
	Grey	90	-,43	0,00	-2,00	2,00	1,17	112,58		
Sleepy – Wide awake	Blue	91	,14	0,00	-2,00	2,00	1,35	138,35	26,323	0,0001
	Yellow	92	,58	1,00	-2,00	2,00	1,03	165,27		
	Grey	90	-,38	-1,00	-2,00	2,00	1,22	106,74		
Sluggish - Frenzied	Blue	91	,12	0,00	-2,00	2,00	1,25	136,88	19,159	0,0001
	Yellow	92	,48	1,00	-2,00	2,00	,97	161,68		
	Grey	90	-,29	0,00	-2,00	2,00	1,26	111,89		

APPENDIX J.4. Mann-Whitney U Test

Table 39. Mann- Whitney U test Results for Blue and Yellow Color Schemes.

	Pleasure	Arousal	Emotional States	Behavioral Intentions
Mann-Whitney U	4052.500	3306.000	3409.500	3463.500
Wilcoxon W	8238.500	7492.000	7595.500	7649.500
Z	-.374	-2.461	-2.169	-2.039
Asymp. Sig. (2-Tailed)	.708	.018	.030	.041

	Bored - Relaxed	Despairing - Hopeful	Unhappy - Happy	Melancholic - Contented
Mann-Whitney U	2638.000	2811.500	1867.500	2040.500
Wilcoxon W	6733.000	6906.500	5962.500	6135.500
Z	-4.241	-3.770	-6.495	-6.005
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

	Annoyed - Pleased	Unsatisfied - Satisfied	Calm - Excited	Unaroused - Aroused
Mann-Whitney U	4179.500	3875.000	3651.000	3612.000
Wilcoxon W	8365.500	8061.000	7837.000	7798.000
Z	-.020	-.938	-1.545	-1.693
Asymp. Sig. (2-tailed)		.984	.348	.122

	Dull - Jittery	Relaxed - Stimulated	Sleepy - Wide awake	Sluggish - Frenzied
Mann-Whitney U	4151.000	3540.000	3410.000	3445.000
Wilcoxon W	8429.000	7726.000	7596.000	7631.000
Z	-.109	-1.875	-2.231	-2.136
Asymp. Sig. (2-tailed)	.913	.061	.026	.033

Table 40. Mann- Whitney U test results for blue and grey color schemes.

	Pleasure	Arousal	Emotional States	Behavioral Intentions
Mann-Whitney U	1954.000	3001.500	2243.500	2081.500
Wilcoxon W	6049.000	7096.500	6838.500	6176.500
Z	-6.085	-3.109	-5.256	-5.741
Asymp. Sig. (2-Tailed)	.000	.002	.000	.000

	Bored - Relaxed	Despairing - Hopeful	Unhappy - Happy	Melancholic - Contented
Mann-Whitney U	2638.000	2811.500	1867.500	2040.500
Wilcoxon W	6733.000	6906.500	5962.500	6135.500
Z	-4.241	-3.770	-6.495	-6.005
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

	Annoyed - Pleased	Unsatisfied - Satisfied	Calm - Excited	Unaroused - Aroused
Mann-Whitney U	2012.000	1926.000	3507.500	3070.000
Wilcoxon W	6107.000	6021.000	7602.500	7165.000
Z	-6.182	-6.319	-1.717	-2.994
Asymp. Sig. (2-tailed)	.000	.000	.086	.003

	Dull - Jittery	Relaxed - Stimulated	Sleepy - Wide awake	Sluggish - Frenzied
Mann-Whitney U	3024.500	3328.000	3196.000	3365.000
Wilcoxon W	7119.500	7423.000	7291.000	7460.000
Z	-3.205	-2.245	-2.617	-2.128
Asymp. Sig. (2-tailed)	.001	.025	.009	.033

Table 41. Mann- Whitney U test results for yellow and grey color schemes.

	Pleasure	Arousal	Emotional States	Behavioral Intentions
Mann-Whitney U	1903.000	2220.500	1934.000	1605.500
Wilcoxon W	5998.000	6315.500	6029.000	5700.500
Z	-6.309	-5.411	-6.213	-7.174
Asymp. Sig. (2-Tailed)	.000	.000	.000	.000

	Bored - Relaxed	Despairing - Hopeful	Unhappy - Happy	Melancholic - Contented
Mann-Whitney U	2380.000	2925.500	2048.500	1854.500
Wilcoxon W	6475.000	7020.500	6143.500	5949.500
Z	-5.137	-3.547	-6.048	-6.649
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

	Annoyed - Pleased	Unsatisfied - Satisfied	Calm - Excited	Unaroused - Aroused
Mann-Whitney U	2061.500	1715.500	2969.000	2646.000
Wilcoxon W	6156.500	5810.500	7064.000	6741.000
Z	-6.120	-7.032	-3.395	-4.359
Asymp. Sig. (2-tailed)	.000	.000	.001	.000

	Dull - Jittery	Relaxed - Stimulated	Sleepy - Wide awake	Sluggish - Frenzied
Mann-Whitney U	2964.000	2709.000	2315.500	2610.000
Wilcoxon W	7059.000	6804.000	6410.500	6705.000
Z	-3.574	-4.169	-5.285	-4.441
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

APPENDIX J.5. Correlation Analysis

Table 42. Correlation analysis results.

Correlations					
Group			Pleasure	Arousal	Emotional States
Blue	Behavioral Intention	r	,637**	,328**	,553**
		p	,000	,002	,000
		N	91	91	91
Yellow	Behavioral Intention	r	,668**	,515**	,666**
		p	,000	,000	,000
		N	92	92	92
Grey	Behavioral Intention	r	,705**	,540**	,678**
		p	,000	,000	,000
		N	90	90	90

APPENDIX J.6. Factor Analysis

Table 43. Factor analysis results for blue color scheme.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,818	48,484	48,484	5,818	48,484	48,484
2	2,331	19,428	67,912	2,331	19,428	67,912
3	,701	5,846	73,758			
4	,577	4,804	78,562			
5	,516	4,299	82,861			
6	,470	3,919	86,781			
7	,371	3,092	89,873			
8	,332	2,767	92,640			
9	,321	2,674	95,315			
10	,251	2,089	97,403			
11	,203	1,688	99,092			
12	,109	,908	100,000			

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	4,214	35,114	35,114
2	3,936	32,798	67,912
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
Sluggish - Frenzied	,879	,215
Sleepy - Wide awake	,871	,197
Calm - Excited	,793	,005
Relaxed - Stimulated	,785	,230
Unaroused - Aroused	,745	,160
Dull - Jittery	,667	,170
Annoyed - Pleased	,045	,888
Unsatisfied - Satisfied	,044	,832
Unhappy - Happy	,254	,816
Melancholic - Contented	,111	,797
Despairing - Hopeful	,408	,706
Bored - Relaxed	,438	,681

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Table 44. Factor analysis results for yellow color scheme.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,818	48,484	48,484	5,818	48,484	48,484
2	2,331	19,428	67,912	2,331	19,428	67,912
3	,701	5,846	73,758			
4	,577	4,804	78,562			
5	,516	4,299	82,861			
6	,470	3,919	86,781			
7	,371	3,092	89,873			
8	,332	2,767	92,640			
9	,321	2,674	95,315			
10	,251	2,089	97,403			
11	,203	1,688	99,092			
12	,109	,908	100,000			

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	4,214	35,114	35,114
2	3,936	32,798	67,912
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component		
	1	2	3
Annoyed - Pleased	,862	,258	,131
Melancholic - Contented	,862	,129	,149
Unhappy - Happy	,797	,165	,313
Unsatisfied - Satisfied	,784	,361	,038
Bored - Relaxed	,619	,346	,536
Dull - Jittery	,424	,409	-,140
Sleepy - Wide awake	,241	,849	,025
Sluggish - Frenzied	,129	,817	,308
Relaxed - Stimulated	,205	,791	,211
Unaroused - Aroused	,312	,604	,365
Calm - Excited	,304	,562	-,418
Despairing - Hopeful	,281	,208	,835

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Table 45. Factor analysis results for grey color scheme.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,348	61,230	61,230	7,348	61,230	61,230
2	1,208	10,063	71,294	1,208	10,063	71,294
3	,976	8,134	79,427			
4	,599	4,994	84,421			
5	,524	4,363	88,784			
6	,354	2,951	91,735			
7	,272	2,267	94,002			
8	,232	1,932	95,934			
9	,168	1,400	97,335			
10	,136	1,137	98,471			
11	,108	,903	99,374			
12	,075	,626	100,000			

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	4,947	41,224	41,224
2	3,608	30,070	71,294
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
Melancholic - Contented	,874	,237
Unhappy - Happy	,862	,348
Annoyed - Pleased	,841	,310
Unsatisfied - Satisfied	,833	,450
Despairing - Hopeful	,770	,376
Bored - Relaxed	,769	,281
Unaroused - Aroused	,613	,384
Sluggish - Frenzied	,310	,860
Sleepy - Wide awake	,285	,858
Relaxed - Stimulated	,300	,800
Dull - Jittery	,261	,598
Calm - Excited	,380	,540

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.