

THE EFFECTS OF VISUAL STIMULI ON IMPULSE  
BUYING BEHAVIOR IN VIRTUAL ENVIRONMENTS

A Master's Thesis

by  
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RÜMEYSA DEMİREL THE EFFECTS OF VISUAL STIMULI ON IMPULSE BUYING BEHAVIOR  
IN VIRTUAL ENVIRONMENTS Bilkent University 2025

Department of  
Interior Architecture and Environmental Design  
İhsan Doğramacı Bilkent University  
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*To my brother,*  
*Halil İbrahim Demirel*



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IN VIRTUAL ENVIRONMENTS

The Graduate School of Economics and Social Sciences  
of  
İhsan Doğramacı Bilkent University

by

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İHSAN DOĞRAMACI BİLKENT UNIVERSITY  
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By R meysa Demirel

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

### THE EFFECTS OF VISUAL STIMULI ON IMPULSE BUYING BEHAVIOR IN VIRTUAL ENVIRONMENTS

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This study examines the influence of visual stimuli on impulse buying behavior. It aims to investigate the effects of particular visual cues of high-image visual stimuli (H-IVS) and low-image visual stimuli (L-IVS)—organization/density, staging techniques, and lighting—on impulse buying behavior. The research questions focus on how visual stimuli increase impulse buying behavior and how personality traits moderate this relationship. In a virtual environment, eighty-four female participants in the study were shown visual cues of a black leather handbag. Each of the visual cues was shown independently. Surveys measuring impulse buying behavior and consumer reaction to visual stimuli were used to gather data. The results suggest that high-image visual stimuli significantly enhance impulse buying behavior through organization/density, staging techniques, and lighting, but not directly on impulse buying tendencies. The study establishes the complexity of consumer behavior, emphasizing the role of visual stimuli and personality traits. Further research would study different retail settings, try different consumer segments, and examine additional product categories to determine how visual stimuli affect impulse buying.

**Keywords:** Consumer Behavior, Impulse Buying, Retail Environment, Visual Cues, Visual Stimuli

## ÖZET

### GÖRSEL UYARANLARIN SANAL ORTAMLARDA İÇGÜDÜSEL SATIN ALMA DAVRANIŞI ÜZERİNDEKİ ETKİLERİ

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Yüksek Lisans, İç Mimarlık ve Çevre Tasarımı Bölümü

Tez Danışmanı: Prof. Dr. Halime Demirkan

Nisan 2025

Bu çalışma görsel uyaranların tüketicinin içgüdüsel satın alma davranışı üzerindeki etkisini incelemektedir. Araştırmanın amacı, yüksek-imajlı ve düşük-imajlı görsel uyaranlara ait belirli görsel ipuçlarının — düzen/yoğunluk, sahneleme teknikleri ve aydınlatma — içgüdüsel satın alma davranışı üzerindeki etkilerini araştırmaktır. Araştırma soruları, görsel uyaranların içgüdüsel satın alma davranışını nasıl artırdığına ve kişilik özelliklerinin bu ilişkiyi nasıl etkilediğine odaklanmaktadır. Sanal bir ortamda yürütülen çalışmada, seksen dört kadın katılımcıya siyah deri bir el çantasının görsel ipuçları ayrı ayrı gösterilmiştir. Veriler, içgüdüsel satın alma davranışını ve tüketicinin görsel uyaranlara verdiği tepkileri ölçen anketler aracılığıyla toplanmıştır. Sonuçlar, yüksek-imajlı görsel uyaranların (organizasyon/yoğunluk, sahneleme teknikleri ve aydınlatma yoluyla) içgüdüsel satın alma davranışını anlamlı şekilde artırdığını, ancak doğrudan içgüdüsel satın alma eğilimleri üzerinde etkili olmadığını göstermektedir. Bu çalışma, tüketici davranışlarının karmaşıklığını ortaya koymakta; görsel uyaranların ve kişilik özelliklerinin rolünü vurgulamaktadır. Gelecek araştırmaların, farklı perakende ortamlarını, farklı tüketici segmentlerini ve farklı ürün kategorilerini inceleyerek görsel uyaranların içgüdüsel satın alma üzerindeki etkisini daha kapsamlı biçimde değerlendirmesi önerilmektedir.

**Anahtar Kelimeler:** Görsel İpuçları, Görsel Uyaranlar, İçgüdüsel Satın Alma, Perakende Ortamı, Tüketici Davranışı

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## **LIST OF ABBREVIATION**

|       |                                         |
|-------|-----------------------------------------|
| H-IVS | High-image Visual Stimuli               |
| IBT   | Impulse Buying Tendency                 |
| IBTS  | Impulse Buying Tendency Scale           |
| L-IVS | Low-image Visual Stimuli                |
| PAD   | Pleasure, Arousal, and Dominance        |
| SPSS  | Statistical Package for Social Sciences |
| SOR   | Stimulus-Organism-Response              |
| SRSQ  | Salesperson's Retail Service Quality    |
| TFT   | Technology Familiarity Test             |
| VE    | Virtual Environment                     |
| VMD   | Visual Merchandising Display            |
| VMDCS | Visual Merchandising Display Cues Scale |
| VVM   | Virtual Visual Merchandising            |
| VR    | Virtual Reality                         |

# **CHAPTER I**

## **INTRODUCTION**

Researchers and retailers have paid much attention to impulse buying in recent years because it affects retail strategies and consumer behavior. Dholakia (2000) defines impulse buying as unplanned, spontaneous acquisition made with little to no thought. There are a variety of factors that affect impulse buying behavior, such as situational or contextual factors (Turley & Milliman, 2000), demographic and sociocultural factors (Zafar et al., 2020), and interior and exterior stimuli (Punj, 2011; Verplanken & Herabadi, 2001). Businesses keen on entering this profitable market need to discover today how visual stimuli affect impulse buying behavior, as the store areas change with the development of visual merchandising. Research on consumer behavior has identified several factors contributing to impulse buying behavior. Previous research shows that visual merchandising is essential for improving store environments' designs and influencing consumers' impulse buying behavior (Argo & Dahl, 2018; Sevilla & Townsend, 2016).

Grewal and Baker (1994) highlight how visually appealing displays can increase product visibility and generate strong consumer feelings. The term visual merchandising display (VMD) represents the visual cues and their holistic organization for displaying a product to consumers, even though visual merchandising can be applied to describing the organization of more than one design cue (Kerfoot et al., 2003). Numerous studies have examined how these visual stimuli and visual cues affect the attitudes and actions of consumers. According to Joy et al. (2014), effective visual stimuli attract consumers' attention and evoke stronger emotional engagement with the

objects on display. Visual stimuli in a store are divided into two as: high-image visual stimuli (H-IVS) and low-image visual stimuli (L-IVS) (Zhu & Meyers-Levy, 2009). High-image describes design elements that reflect elegance, cleanliness, and refinement, while low-image describes environments or stimuli that appear less refined, cluttered, or poorly maintained (Gardner & Siomkos, 1985). The details about visual stimuli were given in the following chapters. However, direct empirical studies of the effect of H-IVS and L-IVS and visual cues on impulse buying are in their early stages and require more investigation. Lighting is a visual cue contributing to how consumers perceive a product (Spence et al., 2014). Lighting may arouse emotions and improve the visibility of products.

On the other hand, staging and organization strategies are essential for focusing the consumers' attention (Seock & Bailey, 2008). Additionally, research indicates that individual characteristics can limit responses to visual cues in retail settings. These differences involve personality traits, such as cognitive and affective states (Verplanken & Herabadi, 2001). This implies that visual stimuli have an impact that extends beyond aesthetics and engage in dynamic interactions with the psychological composition of consumers. Therefore, comprehending how different consumer characteristics and visual cues interact is necessary to enable full inferences concerning impulse buying behavior. The expectations and motives of consumers are constantly changing due to the emergence of experiential retail and more advanced marketing strategies (Tlapan, 2021). Given that these environments intersect, intensive examination of how visual stimuli affect impulse buying is necessary, especially in instances involving visual cues.

## **1.1. Statement of Problem and Aim**

Retailers depend significantly on visual merchandising to attract consumers and stimulate buying behavior. However, the influence and particular visual cues of H-IVS and L-IVS, such as lighting, product organization, and staging techniques, on impulse buying behavior have not been studied extensively. In addition, the effect of personal characteristics on moderating these influences tends to be disregarded in most studies. The absence of thorough research on the effect of visual stimuli on impulse buying behavior is a gap in the literature and retail strategies.

The study aims to fill these gaps by examining the effect of visual cues on impulse buying behavior with the moderating roles of cognitive and affective traits.

Specifically, the study seeks to:

- Analyze how visual cues such as lighting, product organization, and staging techniques influence impulse buying behavior.
- Explain whether cognitive and affective states, personality traits, mediate the relationship between visual stimuli and impulse buying behavior.
- Provide visual merchandising strategies for retailers to develop consumer impulse buying behavior.

This study is limited to a controlled experimental environment that uses virtual reality (VR) simulations. This isolates particular visual merchandising elements while also delivering high reality. The study examines consumers' reactions to virtual retail environments instead of real-world settings, which could present some limitations regarding generalizability.

## **1.2. Structure of the Thesis**

The structure of the thesis is as follows: The study is introduced in the first chapter, which also summarizes the problem statement and the aim of the research. It explains the research questions and highlights why impulse buying behavior regarding visual stimuli must be examined. Moreover, this chapter includes a thesis structure.

The second chapter deals with impulse buying behavior. Before focusing specifically on impulse buying, it discusses consumer buying behavior to develop a broader context. The chapter also examines how people make impulse buying decisions, how one assesses such tendencies, and the essential factors. These factors, divided into internal and external stimuli, demographic and sociocultural components, and situational or contextual impacts, offer a thorough picture of what motivates consumers to buy impulsively.

Visual merchandising is explored in detail in the third chapter. In addition to defining visual merchandising, it offers a historical perspective that places its development in retail settings in context. After that, the chapter goes over the many kinds of VMDs, emphasizing visual stimuli and visual cues and how they are categorized. The idea of visual cues is presented, and their effects on consumers are investigated, connecting them to impulse buying behaviors. The theoretical underpinning of how visual cues influence consumer decision-making is covered in this chapter.

The fourth chapter presents the study methodology. It first covers the conceptual framework that directs the study. This chapter also discusses the product choice of the experiment, participant demographics, and research setting. The chapter describes the stimulus design process and data collection tools, measures, and scales. The end of the chapter describes the data-gathering and data analysis process.

The fifth chapter presents the research results. First, the socioeconomic characteristics of participants exposed to H-IVS and L-IVS are compared. Then, the results of the technology familiarity test (TFT) are analyzed. The chapter also examines impulse buying behavior, the connections between visual cues and impulse buying behavior, and personality traits. Furthermore, reliability evaluations of the study's scales are presented to ensure the validity of the results.

The sixth chapter discusses the results of previous research and analyzes the significance of the connections found in consumer behavior and visual merchandising studies. It emphasizes how the results align with or contradict previous research and highlights the importance of organization/density, staging techniques, and lighting strategies in influencing consumer buying behavior.

The last chapter concludes the thesis. It highlights the research's main conclusions and additions to the body of knowledge regarding visual stimuli and impulse buying. The chapter also discusses the research's applications to retailers and provides the study's limitations and suggestions. Following this chapter are the appendices and references with supplementary information, such as research tools and further data, to support the study's findings.

## **CHAPTER II**

### **CONSUMER BUYING BEHAVIOR**

Consumer buying behavior is a process that characterizes consumers' tendencies; thus, it relates to buying tendencies. Consumer buying behavior describes individuals' product selection, buying, and consumption (Durmaz, 2014). Brand choice and buying behaviors determine consumers' decisions (Ramya & Ali, 2016). Consumer buying behavior identifies the factors influencing consumers to act in a particular manner (Niazi et al., 2012). As Shamri et al. (2021) summarize, cultural, social, personal, and psychological factors are significant when analyzing consumer buying behavior. General consumer buying behavior relates to buying habits, and it is focused on the actions of consumers. The primary factors of consumer behavior must be described to understand consumer behavior.

Individual and environmental factors are the major drivers of consumer buying behavior. Demographics, socioeconomic status, personality, and attitudes stand alone as determinants. An example of exterior determinants that influence consumers' buying behavior is culture (Sata, 2013). Retailers must positively influence consumer buying behavior to survive in the retail business (Tlapan, 2021). Besides, consumer buying behavior can be comprehended well by analyzing different buying behaviors: Performance-Based Buying, Price-Based Buying, Prescriptive Buying, and Impulse Buying (Ünal, 2008) (Figure 1).

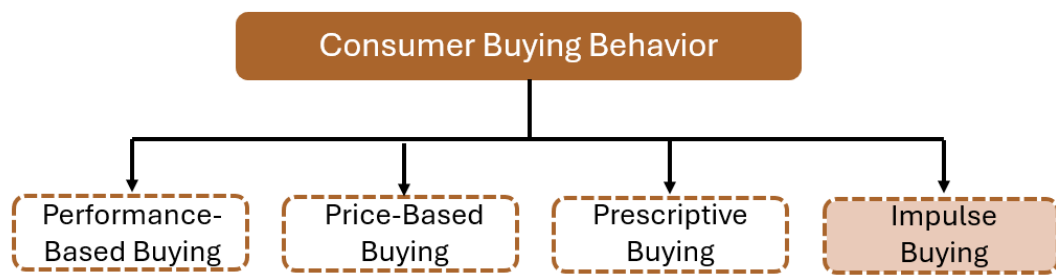


**Figure 1.** Different Buying Behaviors, drawn by the author (2025)

Accordingly, individual and environmental factors and buying behaviors are significant in studying consumer buying behavior. Impulse buying is a significant topic to be researched in consumer buying behavior.

## 2.1. Impulse Buying Behavior

Impulse buying behavior is a consumer behavior pattern characterized by a sudden and intense desire. Impulsivity is the tendency to behave without thinking (Murray, 1938), and numerous disciplines have examined this concept (Dittmar et al., 1995; Dholakia, 2000). Most research on impulse buying used impulsiveness to define a personality trait as a definition of self-control deprivation and the incapacity to resist spontaneous requests (Kacen et al., 2012; Vohs & Faber, 2007).

The DuPont Consumer Buying Habit Studies (1945-1965) first used unplanned buying to describe impulse buying. The definition refers to the gap between products on a consumer's shopping list and the total amount bought (Chow, 2020). Impulse buying is an unplanned buying choice (Stern, 1962). Impulse buying is executed without knowledge of a problem, as proposed by Engel and Blackwell (1982). Cobb and Hoyer (1986) defined impulse buying as a decision made before entering the store without any intention to buy beforehand. In addition, Philipps and Bradshaws (1993) also claimed that buying intention could still change until the point of purchase. Rook (1987) suggested a new understanding of impulse buying as an unusual, selective, and exciting process resulting from sudden and intense emotions that affect the buying decision. Piron (1991) argued that, in addition to unplannedness for impulse buying, the definition must include aspects of 1) the experience of facing a stimulus and 2)

spontaneity in arriving at the buying decision. Overall, impulsiveness in the direction of or towards exposure to internal or external stimulation, e.g., promotions and sales by retailers, is affected by impulse buying, which is also a function of an emotional reaction (Rook & Gardner, 1993). However, Rook and Hoch (1985) proved that consumers would buy without being provoked by external stimuli. Wood (1998) defined impulse buying as a weakness of will, i.e., unplanned buying despite the consumer's superior judgment. The definition of impulse buying was further developed by Bayley and Nancarrow (1998), who classified this term according to motives, benefits, and consumer willingness to shopping experiences. In general, the definition of impulse buying was primarily the focus of different studies. Additionally, the impulse buying tendency is another critical topic that researchers have studied.

Impulse buying happens when consumers suddenly and continuously desire to buy (Karbasivar & Yarahmadi, 2011; Ortiz Alvarado et al., 2020; Xu & Huang, 2014). According to Stern (1962), impulse buying has four types: pure, reminiscence, proposition, and designed. When consumers change their regular buying routines due to an effective stimulus, pure impulse buying occurs (Kimiagari & Asadi Malafe, 2021). Reminder impulse buying occurs when there is limited stock, promotional advertising, and a reminder of previous buying intention (Stern, 1962). Proposition impulse buying happens for consumers who need a product. Consumers with a specified shopping list plan additional buying in response to special offers, and discounts engage in designed impulse buying (Ahmad et al., 2019; Aleke et al., 2011; Chan et al., 2017; Zheng et al., 2019). According to Satyavani and Chalam (2018), the consumer buying behavior process has five steps: need recognition, information search, alternative evaluation, purchase decision, and post-purchase evaluation. This process may change according to consumer attitude and perception (Kimiagari & Asadi Malafe, 2021). On the other hand, impulse buying proceeds relatively quickly (Satyavani & Chalam, 2018) (Figure 2).

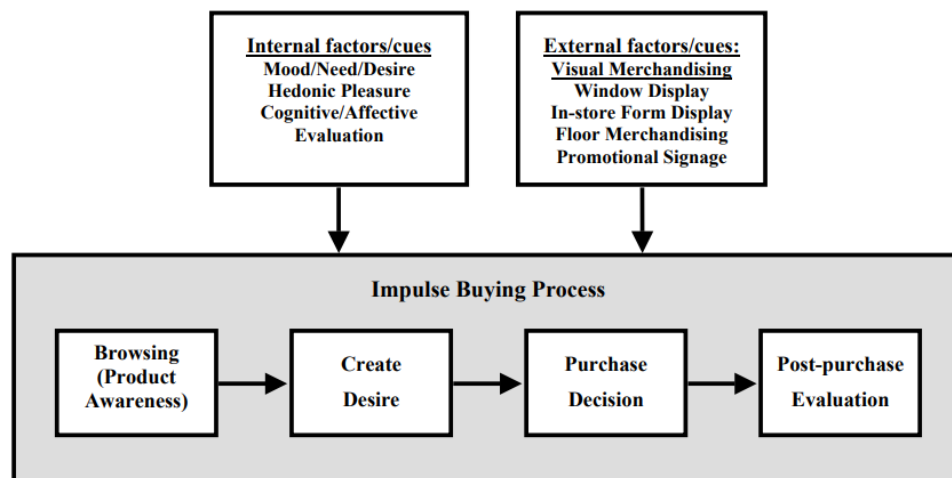


**Figure 2.** Impulse Buying Decision-Making Process, Kim (2003, p.9)

Kim (2003) has revised the impulse buying decision-making model of Churchill and Peter (1998) after eliminating some processes like identifying needs, looking for information, and evaluating alternatives (Raju et al., 2015). Several internal and external stimuli motivate buyers to browse. Even if browsing is unintentional, it provides information and desire for the products (Kimiagari & Asadi Malafe, 2021). Consumers can control internal stimuli like consumer characteristics but have no control over external stimuli like product and store attributes (Lim & Yazdanifard, 2015; Pilgrimienè et al., 2020; Suryawardani et al., 2017). Consumers buy the product without observing it or wasting much time, and afterward, they consider it once it has been bought through post-purchase evaluation (Chan et al., 2017). As a result, environmental stimuli influence the impulse buying decision-making process, including various steps. Like defining the impulse buying process, investigating the factors that influence impulse buying is also one of the main focuses of researchers.

## 2.2. The Influential Factors of Impulse Buying

The influential factors of impulse buying can be examined under different categories. Various categories, including situational or contextual factors (Turley & Milliman, 2000), demographic and sociocultural factors (Cakanlar & Nguyen, 2019), as well as internal (Punj, 2011; Sharma et al., 2010) and external stimuli (Badgaiyan & Verma, 2015; Beatty & Ferrell, 1998; Yu & Bastin, 2010) influence impulse buying (Muruganantham & Bhakat, 2013) (Figure 3).

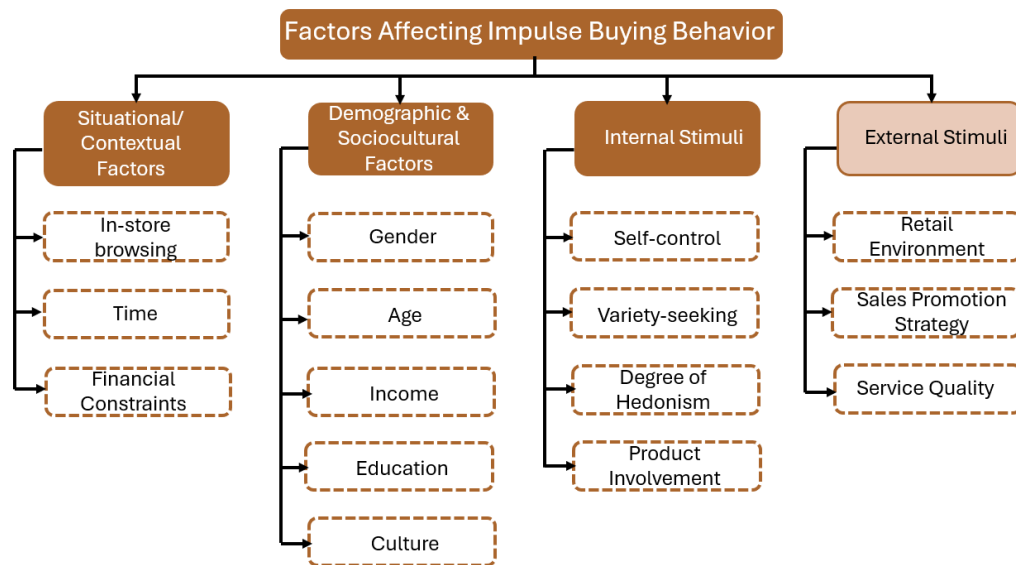


**Figure 3.** Factors Affecting Impulse Buying Behavior, drawn by the author (2025)

Situational factors affecting buying decisions are related to in-store browsing, time, and financial constraints (Beatty & Ferrell, 1998). Gender, age, income, education, and culture belong to demographic and sociocultural factors (Muruganantham & Bhakat, 2013). Variety-seeking and self-control are examples of internal stimuli. Individuals who lose self-control engage in impulse buying (Choi, 2016) in a rush. Another example of internal stimuli is the degree of hedonism or product involvement. Consumers influenced by fashion trends tend to buy impulsively (Park et al., 2006). Internal factors include individual traits influencing buying behavior, psychological states, and socio-demographic factors. In contrast, external factors refer to the store environment and sales strategy (Amos et al., 2014). According to some studies (Chow, 2020; Sharma et al., 2010), different conditions experienced during buying can moderate impulse buying.

### 2.2.1. Situational or Contextual Factors

Situational or contextual factors are the first influential variable of impulse buying. Previous research (Dey & Srivastava, 2017; Sharma et al., 2010) showed that situational and contextual factors can moderate impulse buying. These include in-store browsing, time, and money availability (Chow, 2020). Beatty and Ferrell (1998) discovered that the availability of money positively influences several in-store factors:

in-store browsing behavior and the desire to make impulse buying. Dey and Srivastava (2017) also reported that the availability of money positively influences consumer hedonic motivation and impulse buying intentions. Additionally, individuals impulsively buy more when they have more shopping time (Gehrt & Yan, 2004).

In addition, consumers will be more attracted to quality products if they stay longer to shop within a store (Badgaiyan & Verma, 2015; Jones et al., 2003). Time constraints and store familiarity are the two impulse-buying indicators that Iyer (1989) examined. When time is limited, consumers depend on their recollection of the store environment, which allows them to articulate their wish for a product (Choi, 2016). According to the study, consumers typically buy impulsively when unfamiliar with the store setting and not under time constraints. Tan et al. (2023) explored time constraints and perceived crowding as situational factors. When consumers experience time constraints, perceived crowding lowers their satisfaction. On the other hand, crowds help consumers feel comfortable when there is no time constraint. Overall, in-store browsing, time, and money availability are primary situational and contextual factors. Demographic and sociocultural factors are another influential factor category.

### **2.2.2. Demographic and Sociocultural Factors**

Socio-demographic and sociocultural factors are another category that influences impulse buying. Age, gender, and socioeconomic status correlate highly with impulse buying (Fenton-O'Creevy et al., 2018; Pentecost & Andrews, 2010). Age influences impulse buying, and younger consumers tend to buy impulsively (Dhaundiyal & Coughlan, 2016; Djafarova & Bowes, 2021). Research (Atulkar & Kesari, 2018; Silvera et al., 2008) shows that female consumers tend to buy impulsively more frequently than men. Men and women buy different products and services. According to Dittmar et al. (1996), self-image affects impulse buying. Females impulsively buy symbolic and expressive products, such as jewelry and personal care. Males are more interested in autonomy and functionality and thus tend to be impulsive consumers of sporting equipment and leisure goods.

Additionally, marital status, education level, and income all impact impulse buying behavior (Badgaiyan & Verma, 2015; Leong et al., 2018). According to previous studies, impulse buying correlates positively with income (Atulkar & Kesari, 2018; Krishna et al., 2021; Tifferet & Herstein, 2012). Higher incomes lead to higher impulse buying since consumers have more money to spend. The budget influences buying power, and the greater the budget, the more positive feelings it can evoke, leading to impulse buying (Badgaiyan & Verma, 2015). Therefore, consumers with excess spending income will likely buy impulsively (Beatty & Ferrell, 1998). Other than age, gender, and socioeconomic status, normative and interpersonal factors are also significant.

Normative and interpersonal factors significantly impact (Katakam et al., 2021a; Peck & Childers, 2006). Social norms that define behavior expectations are called normative influences (Rook & Fisher, 1995). By promoting pleasant feelings in the consumer, a positive normative appraisal can encourage impulse buying (Chih et al., 2012; Miao, 2011). The impulse buying behavior is further influenced by the existence of other consumers in the store (Katakam et al., 2021b). The existence of staff, relatives, and friends positively affects impulse buying (Badgaiyan & Verma, 2015; Cheng et al., 2013). The moderating role of employee assistance in the relationship between perceived crowding and impulse buying was examined by Mattila and Wirtz (2008). Understimulation, neutral, and overstimulation were used to categorize stimulation levels (Choi, 2016). They discovered that store environments with attractive stimulation cause consumers to buy impulsively.

According to Luo (2005), social influence best defines impulse buying. He compared how family and friends affected impulse buying. Rather than their family, consumers act more impulsively with their friends. As consumers worry about wasting money while shopping with their families, they buy less impulsively. A population's and individuals' impulse buying behavior is influenced by culture (Chen et al., 2021; Kacen & Lee, 2002). When shopping with their peers, collectivist consumers are more likely to buy impulsively (Kacen & Lee, 2002; Lee & Kacen, 2008). Overall, socio-demographic and sociocultural factors are influential in impulse buying behavior. Another influential factor analyzed by the researchers is the internal stimuli.

### **2.2.3. Internal Stimuli**

The internal stimulus, which takes place within the body, influences impulse buying. Self-control (De Ridder & Gillebaart, 2017; Sun et al., 2021; Xu et al., 2020), negative psychological states (Bandyopadhyay, 2016; Silvera et al., 2008; Verplanken et al., 2005), hedonic goals (Dittmar & Drury, 2000; Harmancioglu et al., 2009; Hausman, 2000; Yu & Bastin, 2010), and materialism (Podoshen & Andrzejewski, 2012; Seinauskiene et al., 2016) are the primary internal stimuli that influence impulse buying.

One of the most important internal stimuli that influences impulse buying is self-control. Impulse buying is frequently caused by a lack of self-control or failure to resist buying temptation (Baumeister, 2002). Self-control enables consumers to resist impulses (Sun et al., 2021; Xu et al., 2020). Apart from self-control, negative psychological states are investigated as another influential factor. Numerous researchers observed the correlation between a tendency for impulse buying and psychological concepts like well-being and self-esteem (Bandyopadhyay, 2016; Silvera et al., 2008). The findings indicated that the affective aspect and subjective well-being, as well as the cognitive aspect and self-esteem, are negatively related (Badgaiyan et al., 2016; Silvera et al., 2008). In addition, hedonic goals are also closely associated with impulse buying.

Consumers buy impulsively to fulfill hedonic goals. The term hedonic goals in consumer behavior implies desires and motivations that arise from the search for pleasure, enjoyment, and sensory satisfaction (Dittmar & Drury, 2000). Numerous studies (Harmancioglu et al., 2009; Hausman, 2000; Yu & Bastin, 2010) reported that consumers engaged in impulse buying to satisfy numerous hedonic desires, including enjoyment, excitement, novelty, praise, relaxation, and socializing. In addition, studies have shown that young adults buy impulsively to achieve hedonic goals (Domina et al., 2012; Gultekin & Ozer, 2012; Luo, 2005; Mangleburg et al., 2004; Rook, 1987; Swami et al., 2013; Yu & Bastin, 2010). Moreover, materialism is a concept that is closely related to hedonic goals (Podoshen & Andrzejewski, 2012). Empirical studies have shown that materialism significantly impacts consumer impulsivity (Podoshen &

Andrzejewski, 2012; Seinauskiene et al., 2016). In most cases, internal stimuli are investigated in several sub-categories, and like internal stimuli, external stimuli are also influential in impulse buying.

#### **2.2.4. External Stimuli**

A stimulus that the organism receives from its surroundings is called an external stimulus and significantly impacts impulse buying. External factors influence retailers' marketing stimuli to encourage impulse buying (Muruganantham & Bhakat, 2013; Youn & Faber, 2000). The primary external stimuli influencing impulse buying behavior are retail environment (Mattila & Wirtz, 2008; Prashar et al., 2017; Wood, 1998), salesperson's retail service quality (SRSQ) (Pornpitakpan et al., 2017), product characteristics (Chen & Wang, 2016; Kacen et al., 2012), and sales promotion (Bandyopadhyay et al., 2021).

Regarding the retail environment, several studies (Mattila & Wirtz, 2008; Prashar et al., 2017; Wood, 1998) demonstrated that visual stimuli, such as product displays and advertising displays, correlate positively with impulse buying. The temptation to impulse buying is triggered by the visual perceived interaction of external stimuli that influence the consumer perception (Chow, 2020). The in-store atmosphere significantly impacts impulse buying (Badgaiyan & Verma, 2015). Impulse buying is significantly influenced by salespeople as well. Retailers try to influence impulse buying behavior at a store by having friendly personnel (Chow, 2020). According to a recent study by Pornpitakpan et al. (2017), good service also increases the impulse buying behavior of consumers. Additionally, product-related factors are also significant external stimuli.

According to Kacen et al. (2012), one of the primary indicators of impulse buying is product-related factors. Products are hedonic or utilitarian (Chen & Wang, 2016; Okada, 2005). Consumers most likely buy hedonic products impulsively (Chen & Wang, 2016). Thus, product characteristics (Park et al., 2012), appealing packaging (Hubert et al., 2013), and affordable prices (Kacen et al., 2012; Kimiagari & Malafe, 2021) have been identified as key impulse buying drivers by research. Furthermore, through sales promotion, retailers can draw consumers' attention and encourage

impulse buying (Bandyopadhyay et al., 2021; Miao et al., 2019). Sales promotions provide consumers with hedonic or utilitarian advantages (Lo et al., 2016). Their instant advantages for consumers are particularly efficient at encouraging impulse buying (Liao et al., 2009; Luo et al., 2021). Additionally, studies have demonstrated that promotions such as free shipping (Dawson & Kim, 2010), cash refunds (Chen & Wang, 2016), package offers (Zafar et al., 2021), and extra contributions (Jeffrey & Hodge, 2007) can improve impulse buying. Overall, external stimuli significantly impact impulse buying. The external stimuli in the literature are the retail environment, the salesperson's retail service quality (SRSQ), product-related factors, and sales promotion. To comprehend the effects of influential factors on impulse buying behavior, measuring IBT must be emphasized.

### **2.3. Measuring Impulse Buying Tendency**

Impulse buying tendency (IBT) is the primary measure for the definition of impulse buying behavior, and as a result, several scales were developed to measure this tendency. Jones et al. (2003) describe IBT as a personality trait that manifests itself in impulse buying across all product categories. Consumers with high impulse buying tendencies will likely react impulsively to stimuli without considering the implications (Chuang et al., 2015). Herabadi et al. (2009) observed that impulse buyers experienced diverse buying experiences on cognitive and affective levels. Impulse buyers are primarily motivated by hedonic factors and positive emotions (Chow, 2020).

Numerous studies (Atulkar & Kesari, 2018; Badgaiyan et al., 2016; Bandyopadhyay, 2016; Prashar et al., 2017) also showed a positive link between IBT and behaviors. For instance, Lucas and Koff (2014) investigated the relationship between IBT and the five dimensions of impulsivity: lack of premeditation, perseverance, seeking of sensation, and positive and negative urgency. A positive correlation exists between lack of premeditation and IBT (Chow, 2020). Besides, Badgaiyan et al. (2016) observed a negative correlation between self-control and IBT. Impulse buying could have two key components: a dominance of emotion and a lack of planning (Rook & Fisher, 1995; Verplanken & Herabadi, 2001). Various scales were developed to measure IBT based on these factors (Rook & Fisher, 1995; Verplanken & Herabadi, 2001). For instance,

Rook and Fisher (1995) defined impulse buying as a tendency to make spontaneous, unplanned, sudden, and dynamic buying behavior, and they developed a scale to measure it. Their findings proved that consumers with an IBT had a higher chance of buying impulsively (Chow, 2020). Next, Verplanken and Herabadi (2001) also investigated the relationship between IBT and personality traits and created a 20-item scale in cognitive and affective aspects. The affective aspects reflect the desire to buy impulsively, excitement, loss of control, and immediate satisfaction. In contrast, the cognitive aspects reflect the degree of immediacy, lack of deliberation, and immediate decision-making (Chow, 2020).

To investigate the relationship between environmental stimuli, personality traits, and individuals' behavioral responses, Mehrabian and Russell (1974) developed the stimulus-organism-response (SOR) model. According to this concept, consumer behavior is influenced by stimuli that improve the individual's internal states as an organism and cause the emergence of specific behaviors. Thus, stimulus, organism, and response are the three main concepts of this model. Stimulus is the first key concept to stimulate emotions (Juárez-Varón et al., 2023). Stimuli are external forces that can be categorized as either marketing mix components or environmental inputs in consumer behavior studies (Bagozzi, 1986).

The organism, the second key concept of the model, is the result of the stimuli. According to Mehrabian and Russell (1974), it refers to the flow of information from external stimuli to the final response of an individual. These interference processes affect emotions, bodily functions, and the cognitive influence of a person (Bagozzi, 1986). According to the SOR model, the organism is a combination of pleasure, arousal, and dominance (PAD), which refer to affective and cognitive processes that control the connection between the stimulus and behavioral reactions of individuals (Mehrabian & Russell, 1974).

Finally, response is the third key concept, which is the outcome of the SOR model. Responses can be categorized as favorable or unfavorable behaviors based on positive or negative stimuli that consumers experience (Donovan & Rossiter, 1982). It refers to the ultimate decisions of the consumers, including approach or avoidance behaviors

(Donovan & Rossiter, 1982; Sherman et al., 1997). Applying the SOR framework, Hashmi et al. (2020) found that store elements, as external stimuli, cause a consumer's hedonic emotions of pleasure and arousal. These feelings act as an organism and cause impulse buying behavior (Redine et al., 2022). In general, a stimulus (S) creates changes in the internal organismic emotional state (O), which in turn causes responses (R) (Garaus & Wagner, 2019). Figure 4 shows the SOR framework developed by Mehrabian and Russell (1974).

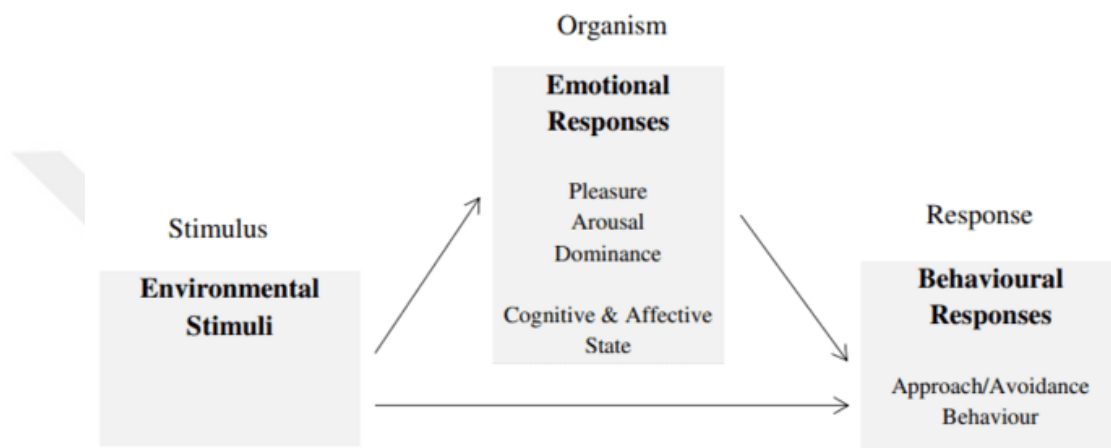


**Figure 4.** Mehrabian and Russell's (1974) SOR model (Logkizidou, 2016, p.86)

The validity of using the SOR model in a study was proved by Donovan and Rossiter (1982) in the context of retail. The authors focused on the connection between emotional states and consumers' behavioral intentions within the store environments. They observed a favorable correlation between the tendency to buy and the pleasure level they experienced in stores. Baker et al. (1992) used the same theoretical framework and discovered that participants' affective states, pleasure, and arousal within a store encouraged the intention to buy. In an online experiment conducted by Ha and Lennon (2010), the authors observed that the pleasure and arousal of the participants are influenced by visual cues, which encourage the consumers' buying intention. In summary, IBT determines the consumer's impulse buying behavior, and the SOR model is developed to show the relationship between external stimuli, personality traits, and impulse buying behavior. While this chapter provides the foundations for measuring IBT, the following chapter examines how visual merchandising is a significant strategic tool influencing impulse buying in retail settings.

## **CHAPTER III**

### **VISUAL MERCHANDISING**

Visual merchandising is a significant visual stimulus in a retail setting. It is the presentation of products and services of a store through advertising, display, merchandising departments, special events, and fashion coordination to promote sales (Astrid & Mustika, 2013). Visual merchandising is one of retailers' most important marketing strategies to attract consumers (Kouчекian & Gharibpoor, 2012). The utilitarian and aesthetic components of visual merchandising are the store layout, presentation, design, color, material, and style (Oh et al., 2007). It is defined as any interior and exterior design to create a positive company image and attract the consumers' attention, interest, and action (Jaini et al., 2021). According to Ortega-S (2011), it is a visual communication tool that gives consumers an idea about the store.

Moreover, visual merchandising communicates a product to a consumer to attract attention (Kerfoot et al., 2003). Therefore, signage, ambiance, shelf organization, department divisions, and store cleanliness are designed to attract consumers and promote impulse buying behaviors (Bhatti & Seemab, 2013). Effective displays and signage encourage consumers to enter the stores and buy (Mehta & Chugan, 2013; Seock & Young, 2013). An efficient visual merchandising arrangement can increase a store's attractiveness and the consumers' impulse buying behavior. As visual merchandising is of great importance to stores and consumers, the visual merchandising research has been significant throughout history.

### **3.1. Development of Visual Merchandising**

Visual merchandising research has evolved as it is crucial to retailers and consumers. Visual merchandising is considered a significant representation of the retail brand (Bailey & Baker, 2014; Mills et al., 1995). According to marketing researchers, visual merchandising became prominent in the 18th century (Parker, 2003). The in-store organization of the products and the design of the store window with mannequins (Law et al., 2012) were valuable cues to promote sales (Bell & Ternus, 2006; Davies & Ward, 2002; Walter & White, 1987). The visual merchandising field emerged from retailers' rising need to switch from verbal engagement to a sensory experience-based retailing environment (Parker, 2003). It is a silent selling technique that carefully arranges products to promote sales (Park et al., 2015). Researchers hypothesized the ideal product placement's impacts to support visual merchandising's influence (Benjamin, 1999; Kerfoot et al., 2003; Skandrani et al., 2011). After the emergence of department stores in the 20th century, understanding visual merchandising gained importance (Bide, 2018). Visual merchandising was extensively studied in fashion retailing (Ha et al., 2007; Jang et al., 2018; Law et al., 2012; Lea-Greenwood, 1998; Zibafar et al., 2019). After other retail categories recognized the benefits of visual merchandising (Ha et al., 2007; Hartman, 1995), its impact on the decision of consumers to enter a store and explore the products (Cant & Hefer, 2012; Sen et al., 2002) made it a popular research topic. Thus, the scope of visual merchandising practices and research has expanded and continues to grow. Moreover, the concept of visual merchandising also continues to evolve.

The concept of visual merchandising has significantly changed over time, reflecting changing perceptions and practices in the retail sector. McGoldrick (1990) first used visual merchandising to describe the design approach and product display. Mills et al. (1995) used the term to highlight the cooperation of multiple departments. Further, Bell and Ternus (2006) emphasized visual merchandising as attracting consumers using mental imagery. Pegler and Bliss (2006) defined visual merchandising as a product presentation to optimize sales and profits. As the concept developed, Diamond and Diamond (2007) defined visual merchandising as a strategic method of presenting a store and its products to attract consumers. Later definitions by Bhalla and Anuraag

(2010) emphasized the value of accessories, self-explanatory displays, and color coordination in product presentation. Bailey and Baker (2014) highlighted its significance in establishing a distinct brand identity, attracting consumers, and keeping their interest longer. Finally, Wu et al. (2015) stressed that visual merchandising combines effective environment and space design to present and attractively display products. This timeline shows how visual merchandising has become a complete approach to attract consumers and improve their shopping experience today (Table 1).

On the other hand, the development of visual merchandising is continuing. The scope of visual merchandising has extended beyond a physical retail setting due to the continuous development of digital technology. Virtual Visual Merchandising (VVM) is an example of this development, which applies the concepts of traditional visual merchandising to virtual environments. VVM creates interactive retail experiences by utilizing VR technologies. VVM enhances consumer engagement and brand perception by replicating the stimuli of physical retail settings in a digital environment (Anderson, 2025). Through immersive design, VVM may mimic physical retail environments in terms of lighting, product arrangement, and spatial layout to affect consumer behavior. Additionally, an experimental study by Raza et al. (2024) examined how VR-based product displays affected consumers' buying behavior. Unlike abstract or imagination-based displays, their results demonstrate that contextual VR displays significantly increase consumer inspiration and desire to purchase. These findings imply that VVM can be an effective tool for commercial and research applications, examining how particular visual cues influence consumer behavior.

**Table 1.** Definitions of Visual Merchandising (Basu et al., 2022, p. 398)

| Author (Year)              | Definitions                                                                                                                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| McGoldrick (1990)          | Visual merchandising is one of the visible elements of positioning strategy; it results from a conceptual approach to store design and merchandise display.                                                                                                    |
| Mills et al. (1995)        | It is the presentation of a store/brand and its merchandise to the consumer through the teamwork of the store's advertising, display, special events, fashion coordination, and merchandising departments to sell the goods and services offered by the store. |
| Bell and Ternus (2006)     | The process of promoting the sale of products involves producing mental images that urge potential consumers to make purchases.                                                                                                                                |
| Pegler and Bliss (2006)    | Visual merchandising is an art of product presentation that communicates product concepts with consumers to optimize product sales and profits.                                                                                                                |
| Diamond and Diamond (2007) | Visual merchandising is the strategic presentation of a company and its products to attract consumers and facilitate purchasing.                                                                                                                               |
| Bhalla and Anuraag (2010)  | The presentation of any merchandise at its best (i) color coordinated (synchronized color); (ii) accessorized (related products/ props), and (iii) self-explanatory (descriptive/ illustrative).                                                               |
| Bailey and Baker (2014)    | Visual merchandising is a process that extends from concept to completion and whose purpose is to create a clear brand identity, maintain its values, attract the consumer into the commercial space, and hold customer's attention for a longer time.         |
| Wu et al. (2015)           | The activity or process of presenting and displaying merchandise, combining the effective design of environments and spaces                                                                                                                                    |

Visual merchandising generally focuses on how the product and brand are visually communicated to the consumer (Sharma et al., 2022). Therefore, whether this message is interpreted appropriately to affect a positive psychological or behavioral outcome is essential for visual merchandising (Kerfoot et al., 2003). Visual merchandising is the art of displaying products in the most aesthetically pleasing way to interact with consumers through visual indicators (Ebster & Garaus, 2011). Visual merchandising is a strategy for communicating with consumers using various visual styles and themes (Law et al., 2012). Therefore, visual merchandising aims to attract consumers, improve the store's appearance, and increase sales.

Moreover, visual merchandising is an effective visual stimulus for consumers. The visual presentation of products influences consumer choice (Walter & White, 1987). As a result of the visual merchandising techniques, retailers are gradually learning that the satisfaction of the consumers is as vital as selling the product (Mehta & Chugan, 2013). Generally, the stimuli of the store are significant to the consumer-product relationship. Aspects relating to place, products, and consumers are all stimuli in retail (Quartier et al., 2009). The eyes gather most of these stimuli (Tullman & Rose, 2004). Consumer characteristics, including sensory pleasure, affective pleasure, and cognitive pleasure, are all included in visual merchandising (Fiore et al., 2000). When under stress, consumers generally make planned buying and spend less time or money on impulsive buying (Donovan et al., 1994). The shopping time and buying amount are closely related, so the visual stimuli must be adequate for consumers to stay in the store longer (Mehta & Chugan, 2013). Therefore, the most essential visual merchandising element, the VMD, must be sifted through.

### **3.2. Visual Merchandising Display**

VMDs are a product presentation element. A VMD is a visual stimulus consumers receive to see and assess a product (Logkizidou, 2021). According to Mathew (2008), VMDs are visual presentations that attract consumers. Visual displays can cause consumers to make impulsive buying because, after exposure to visual stimuli, a desire may lead consumers to make unplanned buying (Cant et al., 2013) (Figure 5). By giving information through visual stimuli and suggestive advertising, the VMD

technique is called the silent salesperson (Bhalla & Anuraag, 2010). Thus, VMDs save the salesperson and the consumer time by providing simple and faster buying (Cant & Hefer, 2014). Several display methods are extensively used in various retail settings, from local shops to contemporary commercial stores like boutiques, malls, and showrooms (Mathew, 2008). The goal of each display element is significant in each retail setting.

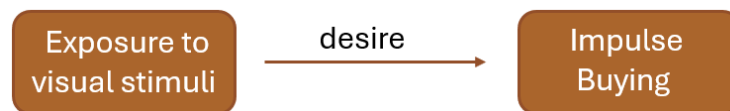


**Figure 5.** Factors Affecting Impulse Buying Behavior, drawn by the author (2025)

VMD aims to create an attractive image by providing further props, colors, fixtures, signage, and graphics to attract consumers and encourage them to stay in the store longer (Widayati et al., 2019). According to Wiid (2012), the primary goal of VMD is to increase overall sales in stores. First, it is crucial to remember that visual displays must attract consumers by utilizing vibrant colors, convenient lighting, and dynamic movement. Second, visual displays must capture and maintain the attention of the consumers. Finally, visual displays should encourage consumers to observe the product closely before buying. According to Kerfoot et al. (2003), visual merchandising represents the macro-level visual cues. The goal is to describe the store's image while providing a pleasant experience for consumers. VMD specifically draws attention to the micro-level display cues that aim to display the product (Law et al., 2012). VMDs are used effectively in stores to support sales, interact with consumers, and communicate the brand image of the retailers (Levi & Weitz, 2009). The goal of retailers in using VMDs is to employ window displays to attract consumers and use VMDs to promote sales (Cant & Hefer, 2014). According to the goals, the types of VMD also change.

According to purpose, placement, and product type, VMD varies. In-store displays, point-of-purchase displays, and window displays are three types of VMDs (Wiid, 2012) (Figure 6). Self-selection and unique displays are two categories of in-store displays. Regarding self-selection displays, products are displayed in aisles or on wall units so consumers can examine them themselves (Bell & Ternus, 2012). Unique displays present the products to catch the consumers' attention and leave a positive impression.

Such displays are typically positioned in stores where they receive the most exposure, such as above counters, next to the point of purchase, near store entrances, and in paths with high consumer activity (Nell, 2017).



**Figure 6.** Visual Merchandising Display Types (i) In-store display, Retrieved from <https://tr.pinterest.com/pin/2181499815375534/>, (ii) Point-of-purchase display, Retrieved from <https://tr.pinterest.com/pin/488288784618321781/>, (iii) Window display, Retrieved from <https://tr.pinterest.com/pin/235735361739979359/>

Moreover, point-of-purchase displays stimulate impulse buying behavior more than the other VMD types (Wiid, 2012). These displays might include banners and video screens to promote the products on sale (Nell, 2017). Finally, the window display is a significant communication method crucial in stimulating consumers' buying behavior (Jaini et al., 2021). The first impression of a store is generally provided by the window display (Astrid & Mustika, 2013). Window displays are key visual stimuli that promote sales, particularly for new products (Seock & Young, 2013). Moreover, the window display is essential to convey intended messages and to provide a further stimulus for the development of visual merchandising (Kernsom & Sahachaisaeree, 2012).

Researchers argue that VMD could act as a crucial cue for evaluating consumer behavior; however, they rarely conduct empirical and quantitative research in this field (Davies & Ward, 2005). Table 2 shows the first relevant research that conducted experiments to examine the VMDs quantitatively.

**Table 2.** First quantitative research on visual merchandising displays (Logkizidou, 2016, p.62)

| Literature               | Study                                            | Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental Psychology | Morrow and McElroy (1981); Sadalla et al. (1987) | People rely on interior design cues to form inferences about a place and the owner of that place.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Marketing and Retailing  | Gardner and Siomkos (1985)                       | Using verbal description of the store environment cues, the authors found that the participants' evaluations of a brand of perfume elevated in a store environment consisted of 'high-image' design cues (e.g., soft lighting, carpeted floors, wide aisles and clean and large dressing rooms) as compared to when the same perfume was presented in a store comprised of low-image design cues (e.g., harsh lighting, linoleum/tile floors, narrow aisles, and dirty and small dressing rooms).                                                                                                                                                          |
|                          | Mazursky and Jacoby (1986)                       | Consumers heavily rely on the stores' interior design cues when evaluating a product's quality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | Bitner (1990)                                    | The physical surroundings of the place where a service is taking place affects both the consumers' and the employees' behaviour. The participants made inference about the efficiency of a provided service based on the physical environment of a travel agency.                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Bellizzi et al. (1983), Crowley (1993)           | Participants, exposed to pictorial instruments, 'responded' differently to the colours of a retail furniture display (five groups of people experienced one of five colours: red, yellow, green, blue, or white). Findings suggest that colour can psychically attract the consumers to approach the product on display or encourage them to browse in the store for longer. Each colour has perceptual qualities which accordingly affect the consumers' product and store perceptions. In general, a product was perceived to be more 'up to date' when it is presented in a warmcoloured retail environment than in a cool-coloured retail environment. |

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Table 2 Continued

| Literature | Study                   | Findings                                                                                                                                                                                                                                                                                                                                         |
|------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | Grewal and Baker (1994) | The authors found that only when both the design and ambient cues were of high-image they affected the participants' acceptability of price. In turn, price acceptability increased the participants' purchase intentions.                                                                                                                       |
|            | Baker et al. (2002)     | The authors found that design cues had a relatively strong effect on the key aspects that determine the consumers' store choice. In particular, high-image design cues enhanced the participants' perceptions of the product's quality, which in turn elevated the product's perceived value and also determined the participant's store choice. |

Environmental psychology provided the initial support for the impact of design cues as visual stimuli in a store environment. Researchers employed a quantitative approach to examine the impact of visual stimuli on general perceptions of a place and its owner in the house and workplace (Sadalla et al., 1987; Zweigenhaft, 1976). Researchers in marketing and retailing showed that design cues as visual stimuli in a store can influence consumer perceptions (Mazursky & Jacoby, 1986). Additionally, some researchers divided visual stimuli into two as high and low-image visual stimuli groups according to design cues.

### 3.2.1. Visual Stimuli

Researchers have claimed that consumers frequently develop shared associations with their surroundings to separate the VMD into high-image (H-IVS) and low-image visual stimulus (L-IVS) groups (Zhu & Meyers-Levy, 2009). Therefore, some elements convey particular ideas, which can be applied to the displayed product. High-image describes design elements that reflect cleanliness and refinement. H-IVS are associated with carefully curated design elements, such as soft lighting, wide aisles, upscale finishings, and clean or wide environments (Gardner & Siomkos, 1985). On the other hand, low-image describes environments or stimuli that appear less refined, cluttered, or poorly maintained. L-IVS are characterized by harsher lighting, narrow aisles,

utilitarian finishing materials, and small environments (Gardner & Siomkos, 1985). According to research, individuals prefer to infer a store and product quality primarily based on the high-image or low-image cues (Baker et al., 1994). Therefore, consumers infer luxury from the displayed product when they view it among H-IVS. Based on this idea, consumers could use visual stimuli groups as informational stimuli when evaluating a displayed product. Grewal and Baker (1994) claim that when H-IVS are combined, consumers' price acceptance and, eventually, their buying behavior are greatly increased. This result emphasizes how consumers' value judgments can be significantly impacted by integrated visual stimuli in the retail setting. Similar findings were made by Baker et al. (2002), who discovered that H-IVS had a direct impact on consumer perceptions of product quality and store appeal, which in turn influenced their store choice and buying behavior. As a result, the division of VMDs into groups based on H-IVS and L-IVS offers a helpful framework for comprehending how consumers behave in various retail environments. Visual cues in a store environment are categorized according to these visual stimuli.

### **3.2.2. Visual Cues**

VMD cues are visual cues used in stores to present and promote products. Because 90% of environmental cues are perceived visually, visual cues in a store environment are significant (Edwards & Shackley, 1992). VMD represents the holistic organization of visual cues for displaying a product to consumers (Kerfoot et al., 2003). However, empirical attention to visual merchandising and display needs to be improved in the literature, particularly in terms of the H-IVS and L-IVS groups (Chan & Chan, 2008). According to research (Kerfoot et al., 2003; Logkizidou et al., 2019), visual cues were categorized in an expanded VMD typology to understand each design cue.

According to the qualitative study by Kerfoot et al. (2003), display elements that influence consumers' buying behavior include fixtures, materials, display layout, presentation technique, and lighting. Logkizidou et al. (2019) use the same hypothetical typology to describe the museological display, corresponding to museological display fixtures, materials, presentation, organization, and lighting approaches. Logkizidou (2021) tests these five suggested display elements on a higher-order VMD construct.

The study proposes a five-dimensional extended VMD typology consisting of fixture type, quality of materials, organization/density, staging technique, and lighting, as suggested by qualitative and quantitative studies (Table 3). According to the previous study, the VMD are categorized into H-IVS and L-IVS groups with different visual cues (Baker et al., 1994; Gardner & Siomkos, 1986; Grewal & Baker, 1994). As a result, Logkizidou (2021) provides a qualitative typology of visual cues. Their study identified key visual cues and classified them into five categories by examining existing literature (Argo & Dahl, 2018; Joy et al., 2014; Logkizidou et al., 2019; Sevilla & Townsend, 2016).



**Table 3.** Visual stimuli and visual cues typology (Adapted from Logkizidou, 2021, pp. 311-312)

| Visual Cues          | High-Image<br>Visual Stimuli                     | Low-Image<br>Visual Stimuli              | Relevant Literature                                                                                                                                                         |
|----------------------|--------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fixture type         | Pedestals/raised platforms (less items)          | Shelves (less items)                     | Argo & Dahl, 2018; Borghini et al., 2009; Dion & Arnould, 2011; Hansen & Wänke, 2011; Joy et al., 2014; Kerfoot et al., 2003; Logkizidou et al., 2019; Vukadin et al., 2016 |
|                      | Tables (more items)                              | Rails (more items)                       |                                                                                                                                                                             |
|                      | Abstract/<br>Semi-realistic mannequin formations | Realistic mannequins                     |                                                                                                                                                                             |
|                      | Glass cases                                      | No glass cases                           |                                                                                                                                                                             |
| Quality of Materials | Gilded/golden/polished brass/nickel              | Nongilded/golden / polished brass/nickel | Baker et al., 1994; Dion & Arnould, 2011; Joy et al., 2014; Kerfoot et al., 2003; Spence & Gallace, 2011; Zhu & Meyers-Levy, 2009                                           |
|                      | Reflective                                       | Matte                                    |                                                                                                                                                                             |
|                      | Marble                                           | No marble                                |                                                                                                                                                                             |
|                      | Glass                                            | Plastic                                  |                                                                                                                                                                             |
|                      | Hardwood                                         | No hardwood                              |                                                                                                                                                                             |
|                      | Metallic                                         | Organic/natural (e.g., Burlap)           |                                                                                                                                                                             |

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Table 3 Continued

| Visual Cues              | High-Image<br>Visual Stimuli                                                  | Low-Image<br>Visual Stimuli                                 | Relevant Literature                                                                                                                                                                                                                                                                                                                         |
|--------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Organization/<br>Density | Neat/tidy (i.e., well organized: folded, item grouping, color blocking, etc.) | Messy/cluttered (i.e., unorganized)                         | Baker et al., 1994; Dion & Arnould, 2011; Joy et al., 2014; Kerfoot et al., 2003; Logkizidou et al., 2019; Reynolds-Mcilnay et al., 2017; Sevilla & Townsend, 2016                                                                                                                                                                          |
|                          | Low-merchandise display density (e.g., single-item display)                   | High-merchandise display density (e.g., multi-item display) |                                                                                                                                                                                                                                                                                                                                             |
|                          | Decorative/<br>Informational<br>Minimalism                                    | Decorative/<br>Informational<br>Maximalism                  |                                                                                                                                                                                                                                                                                                                                             |
| Staging<br>Technique     | Artistic/museological staging                                                 | Artistic/<br>museological<br>vacuum                         | Baker et al., 1994; Borghini et al., 2009; Dion & Arnould, 2011; Grewal et al., 2016; Garaus & Wagner, 2019; Hollenbeck et al., 2008; Hagtvedt & Patrick, 2008; Huettl & Gierl, 2012; Joy et al., 2014; Lee et al., 2015; Logkizidou et al., 2019; Mazursky & Jacoby, 1986; Pino et al., 2017; Vukadin et al., 2016; Roggeveen et al., 2020 |
|                          | Conceptual display                                                            | Exposed display                                             |                                                                                                                                                                                                                                                                                                                                             |
|                          | Creative director's/<br>designer's credentials                                | No creative<br>director's/<br>designer's<br>credentials     |                                                                                                                                                                                                                                                                                                                                             |
|                          | Storytelling                                                                  | No storytelling                                             |                                                                                                                                                                                                                                                                                                                                             |
|                          | Tech staging (e.g., customisation, personification, product experience)       | Tech staging<br>vacuum/tech<br>gimmick                      |                                                                                                                                                                                                                                                                                                                                             |
| Lighting                 | Satisfactory                                                                  | Basic                                                       | Areni & Kim, 1994; Baker et al., 1994; Dion & Arnould, 2011; Gardner & Siomkos, 1985; Joy et al., 2014; Kerfoot et al., 2003; Logkizidou et al., 2019; Murray et al., 2019; Reynolds-Mcilnay et al., 2017                                                                                                                                   |
|                          | Incandescent spotlights (warm white)                                          | Fluorescent striplights (cool white/ color)                 |                                                                                                                                                                                                                                                                                                                                             |
|                          | High brightness contrast                                                      | Low brightness contrast                                     |                                                                                                                                                                                                                                                                                                                                             |
|                          | Accent lighting (product focus)                                               | Ambient lighting (general focus)                            |                                                                                                                                                                                                                                                                                                                                             |

Environmental and physical dimensions can be used to group these visual cues. This classification helps us understand how various visual cues affect consumer behavior regarding environmental and physical aspects (Figure 7). Fixture type and quality of materials have mainly physical dimensions. These elements relate to the tangible aspects that consumers directly interact with. On the other hand, among the five visual cues, organization/density, staging technique, and lighting can be classified under the environmental aspects. These elements are related to the organization of the store environment and the manipulation of space that affect consumer behavior.

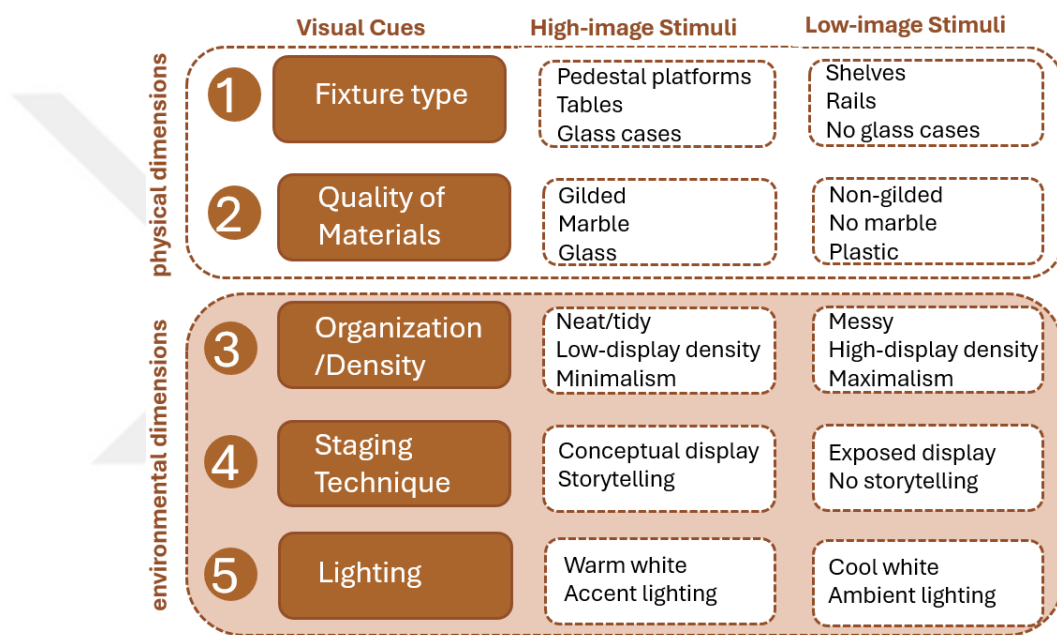


**Figure 7.** Categorization of Visual Cues, drawn by the author (2025)

According to Fahreza et al. (2024), the organization and density of the product are key elements of store atmospherics, which refers to the environmental dimensions of the store. Moreover, retailers employ various techniques of product staging to create a sophisticated store environment for consumers (Dion & Arnould, 2011), so the staging technique of the product is another environmental aspect among the visual cues. Lastly, lighting significantly improves the store environment (Kamaal et al., 2024). This study mainly concentrates on the visual cues belonging to the environmental dimensions. Separating design cues according to H-IVS and L-IVS makes understanding their effects on consumer behavior possible. Defining H-IVS and L-IVS by considering visual cues would make these effects more understandable.

First, the fixture type points out the display elements to present the merchandise.

According to research, pedestals and glass cases promote the image of the brand (Argo & Dahl, 2018; Dion & Arnould, 2011; Hansen & Wänke, 2011). Additionally, using tables and cubes rather than rails and shelves represented an effective design (Kerfoot et al., 2003). High-image cues are typically designed as pedestals and museum glass cases (Logkizidou et al., 2019). According to Meyers-Levy and Peracchio (1992), merchandise presented on pedestals or raised platforms is correctly perceived because consumers observe it at eye level.

Second, the quality of the materials is another element of the visual cues. In contrast to plastic display fixtures, gold-colored, marble, wood, and glass fixtures give the products a luxury appearance (Baker et al., 2002; Joy et al., 2014). Products displayed on glass surfaces provide a high-image impression (Kerfoot et al., 2003). Additionally, using wooden cloth hangers demonstrates quality, unlike unattractive and cheap plastic hangers. Also, display items of heavier materials, such as marble or gold, are considered high-quality fixtures (Spence & Gallace, 2011). Using expensive and reflective materials generates the impressions of sterilization, more space, and brightness (Joy et al., 2014; Yun & Good, 2007).

Third, organization/density, related to perceptions of product availability, refers to how a VMD is organized and the number of products on display (Joy et al., 2014).

Therefore, displaying limited products demonstrates that the store and brand image are valuable. Moreover, neat and limited displays were linked to more luxury brands (Kerfoot et al., 2003). The high price and quality of the brand can be inferred from the display of single-spread pants, as it shows that the store can afford the space. Sevilla and Townsend (2016) investigated the impact of the space-to-product ratio on consumer perceptions. They observed that when a product was displayed in a larger space, consumers were more likely to buy it because they perceived the store and the products as more valuable.

Next, the staging technique, which refers to product performance, is also highlighted as a significant visual cue. For instance, Dion and Arnould (2011) discuss how luxury retailers use staging techniques by using pictures and signs of the designer to reflect

their value onto the products. The staging of the product and perception of luxury would be improved by using art in the presentation (Hagtvedt & Patrick, 2008; Lee et al., 2015; Pino et al., 2017). However, museological staging techniques also give the objects on display a sense of luxury by referencing the art world (Logkizidou et al., 2019). Sometimes, brands with high-image perceptions are created due to the concept of display and symbolism (Borghini et al., 2009). Storytelling displays that describe the product's history or the manufacturing process also increase the quality of brands (Dion & Arnould, 2011; Hollenbeck et al., 2008). These displays make it possible to use in-store educational content, such as educational signage and documentaries, on in-store video screens (Logkizidou, 2021). Technology and specialized display elements make it easier to stage a product by teaching consumers while displaying the products (Vukadin et al., 2016).

Finally, display lighting is another essential cue in the retailing research. Numerous studies (Joy et al., 2014; Kerfoot et al., 2003) recognize the value of lighting in emphasizing products to attract consumers. Perceptions of lower product quality are linked to using several lighting styles, such as fluorescent strip lighting (Kerfoot et al., 2003). According to Reynolds-McIlnay et al. (2017), backdrop lighting influences the contrast of the product with its surroundings, while high contrast promotes consumers' attention and buying decisions. However, the brightness contrast positively affects consumer buying decisions when the products are well-organized. Accent lighting was generally discovered to influence consumer perception positively (Areni & Kim, 1994; Dion & Arnould, 2011). Typically, it is possible to investigate the visual cues into two categories: Environmental and Physical Dimensions. It is significant to examine the impact of VMD on consumer behavior.

### **3.3. Impact of Visual Merchandising Display on Consumer Behavior**

VMD has a significant impact on consumer behavior. Environmental psychology research and the inference theory (Morrow & McElroy, 1981; Sadalla et al., 1987; Zweigenhaft, 1976) provided the first-ever evidence of how store design elements influence consumer perceptions. According to inference theory, consumers are not passive receivers in a store environment (Baker et al., 1994; Bitner, 1992; Grewal &

Baker, 1994). In contrast, consumers actively seek cues to conclude about the retailer and products during their buying process (Huber & McCann, 1982). Moreover, the impact of VMD was the focus of numerous studies (Argo & Dahl, 2018; Bellizzi et al., 1983; Dion & Arnould, 2011; Joy et al., 2014; Kerfoot et al., 2003; Logkizidou, 2021; Sevilla & Townsend, 2016). At the micro-level, previous research extensively studied the influence of VMD on buying intentions (Hagtvedt & Patrick, 2008; Logkizidou, 2021).

In general, VMD and store environment features are the most significant factors in consumers' buying decisions (Logkizidou et al., 2016). In their qualitative study, Kerfoot et al. (2003) discovered that, while an appealing product display does not always lead to buying, it does increase the likelihood of buying by four times. Grewal and Baker (1994) hypothesized that the price acceptability of a high-image brand enhances the consumer's buying intentions. On the contrary, Law et al. (2012) observed that when display cues highlighted the feelings of sexuality, it provoked adverse emotional reactions and influenced buying intentions. A perception of luxury with a brand may boost the tendency to buy it (Shukla & Purani, 2012). VMD also significantly impacts consumers' impulse buying behavior.

VMDs are environmental stimuli that interact with the senses of the consumers. According to Gudonaviciene and Alijosiene (2015), attractive visual merchandising may stimulate consumers to buy impulsively in retail. The urge to buy is hedonically complex and may produce conflicting emotions (Jaini et al., 2021). Therefore, VMDs are utilized by apparel retailers as a visually stimulating strategy to articulate the impulse buying behavior of consumers (Sundstrom et al., 2019). Consequently, visual merchandising elements serve as cues that trigger consumers to behave impulsively (Jaini et al., 2021). However, there needs to be more literature regarding the correlation between impulse buying behavior and H-IVS and L-IVS, and visual cues related to these stimuli. Based on this literature review, the following chapter describes the study's methodology.

## **CHAPTER IV**

### **METHODOLOGY**

This chapter describes the study's objectives and methodology based on the prior literature review. It also explains the experiment carried out as part of this research and details the research questions and hypotheses. The study's conceptual framework is provided, and the participants, setting, stimuli, instruments, tools, measurement, scale, and procedure are presented.

Although retailers know displays influence consumers' buying behavior, analyzing how specific visual stimuli affect consumers' impulse buying behavior is still problematic. As a result, the effect of particular visual stimuli and visual cues on impulse buying behavior remains relatively unexplored, and numerous researchers acknowledge that they need to be made aware of the significance and the mechanisms of the H-IVS and L-IVS (Joy et al., 2014). Also, the effect of personality traits on moderating the relationship between visual stimuli and impulse buying behavior is disregarded.

The study aims to help retailers understand how specific visual stimuli impact consumers' impulse buying behavior while focusing on the moderating roles of personality traits such as cognitive and affective traits. Its results would contribute to understanding consumer behavior in the retail context and provide retailers with valuable knowledge to enhance their store designs and marketing plans. The research questions and hypotheses were created to answer these objectives and research gaps.

## **4.1. Research Questions and Hypotheses**

The study's research questions and hypotheses (Table 4) examine the relationship between visual stimuli and consumers' impulse buying behavior.

### **Research Questions:**

RQ1: How do the visual cues differ between high and low-image visual stimuli in virtual environments?

RQ2: How do the personality traits differ between high and low-image visual stimuli in virtual environments?

RQ3: Do the visual stimuli and visual cues dictate impulse buying behavior in virtual environments?

RQ4: Are there mediating variables that explain the relationship between the visual stimuli and impulse buying behavior in virtual environments?

### **Hypotheses:**

H1: There is a significant difference in visual cues between high and low-image visual stimuli in virtual environments.

H1A: There is a significant difference in the organization/density between high and low-image visual stimuli in virtual environments.

H1B: There is a significant difference in the staging techniques between high and low-image visual stimuli in virtual environments.

H1C: There is a significant difference in the lighting between the high and low-image visual stimuli in virtual environments.

H2: There is a significant difference in personality traits between high and low-image visual stimuli in virtual environments.

H2A: There is a significant difference in the cognitive states between high and low-image visual stimuli in virtual environments.

H2B: There is a significant difference in the affective states between high and low-image visual stimuli in virtual environments.

H3: The visual stimuli and visual cues dictate impulse buying behavior in virtual environments.

H4: The visual stimuli affect impulse buying behavior through their influence on personality traits in virtual environments.

**Table 4.** Summary of hypotheses and list of variables drawn by the author (2025)

| <i>Hypothesis</i> | <i>Independent Variable</i>                                                        | <i>Dependent Variable</i>  | <i>Predicted Sign</i> |
|-------------------|------------------------------------------------------------------------------------|----------------------------|-----------------------|
| <b>H1</b>         | Visual Stimuli                                                                     | Visual Cues                |                       |
| <b>H1A</b>        | Visual Stimuli                                                                     | Organization/Density       |                       |
| <b>H1B</b>        | Visual Stimuli                                                                     | Staging Techniques         |                       |
| <b>H1C</b>        | Visual Stimuli                                                                     | Lighting                   |                       |
| <b>H2</b>         | Visual Stimuli                                                                     | Personality Traits         |                       |
| <b>H2A</b>        | Visual Stimuli                                                                     | Cognitive States           | +                     |
| <b>H2B</b>        | Visual Stimuli                                                                     | Affective States           |                       |
| <b>H3</b>         | Visual Stimuli +<br>Visual Cues                                                    | Impulse Buying<br>Behavior |                       |
| <b>H4</b>         | Visual Stimuli<br><b>Mediating Variables:</b><br>Cognitive and Affective<br>States | Impulse Buying<br>Behavior |                       |

A conceptual framework was developed to construct a complete picture of the study's research questions and hypotheses.

## 4.2. Conceptual Framework

The conceptual framework of this study is developed by modifying the SOR model to describe how visual stimuli and visual cues affect consumers' cognitive and affective states, contributing to impulse buying behavior (Figure 8). From the SOR model perspective, H-IVS and L-IVS are the main stimuli of the present study. Under the visual stimuli, this study mainly concentrates on the visual cues belonging to the environmental dimensions: organization/density, staging technique, and lighting.

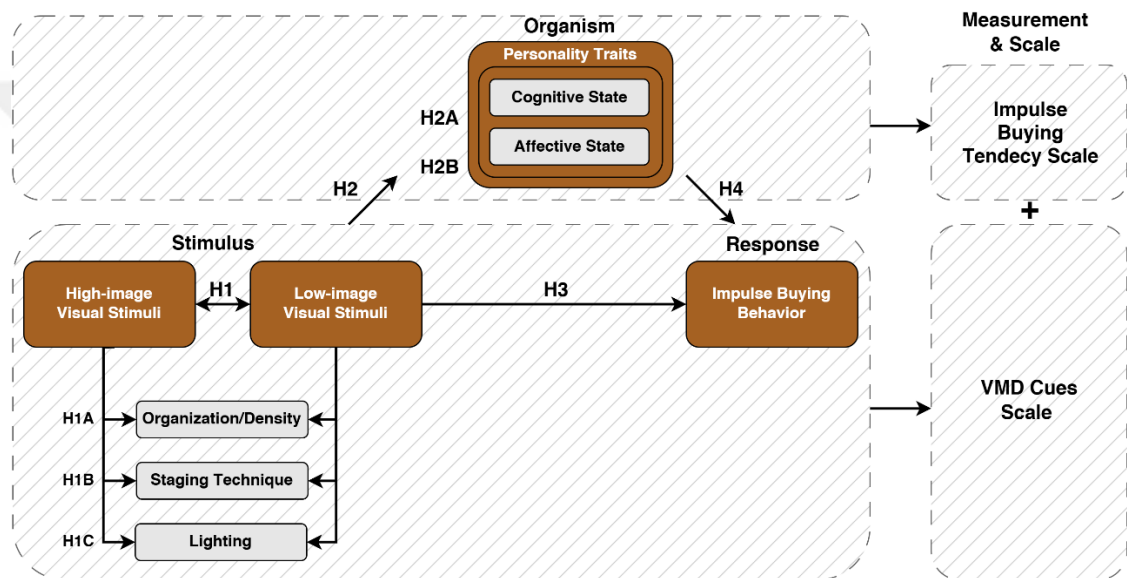


**Figure 8.** Conceptual framework, drawn by the author (2025)

After determining the stimuli, consumers' cognitive and affective states are categorized as organisms in this study context when exposed to visual stimuli. Finally, the response is the impulse buying behavior of the consumers. As a result, this study categorizes consumer responses as impulse buying behaviors where they rely on the visual stimuli as visual cues. An experiment was conducted to test the hypotheses presented in the conceptual framework.

### **4.3. Experiment**

VVM was used for the experiment to examine how particular visual cues influence consumer behavior. The primary method for examining the study hypotheses presented in the conceptual framework was a true experiment. The visual cues were manipulated as the independent variable, impulse buying behavior was measured as the dependent variable, and other external variables were controlled. According to Webster and Sell (2014), the obtained data were objective and less biased. The first step of this empirical investigation was finding the proper participants to measure impulse buying behavior.

#### **4.3.1. Participants**

Female students were selected as suitable participants for the experiment. Younger female consumers generally buy high-end, branded, luxury products (Zuo, 2024). The consumption of luxury products by younger consumers is more likely to be associated with the products they use to demonstrate their financial ability and gain recognition from others (Zuo, 2024). Thus, the sampling frame is determined as female students from Bilkent University. This sampling frame is used to select a sample of consumers using a convenience sampling design as a nonprobability sampling method. This method was used since the samples are convenient to set up, affordable, and representative within the parameters of the planned research. Furthermore, university students' demographics, education, and socioeconomic backgrounds are generally homogeneous, which could reduce the impact of these potential confounding variables on the study results (Liu et al., 2012).

The number of participants in the study was determined to be 77 using G\*Power 3.1.9.7, a tool for statistical power analyses. To achieve a power of 0.80 with an alpha level of 0.05 and a medium effect size (Cohen's  $f^2 = 0.50$ ), the study indicated that a minimum of 77 participants would be required. Individuals were recruited more than the minimum to account for possible attrition. Thus, the sample consisted of 84 female students. All the participants were over 18 years old. Participants' age range was between 18 and 33, and the median age of the participants was 21.

Before the experiment, the participants were asked to sign the Student Consent Form (see Appendix A). Informed consent forms describing the research objectives and possible risks were given to participants. There was a debriefing for the participants, and all questions and concerns were addressed. They became aware of the study's goals and its usage of VR technology. Participants were also given a briefing on impulse buying behavior to avoid confusion and maintain the validity of the answers. As a result, informed consent was obtained from all participants after being advised of the risks and benefits of participation. Throughout the study, participant anonymity and confidentiality were ensured. Participants could withdraw from the steps during the survey at any point, and participation was optional. The participants received no payment for taking part in the experiment. Participants with severe dizziness when using VR equipment or low vision, which made it difficult to distinguish the visual stimuli, were excluded from the study to maintain the validity of the results. Next, to conduct the experiment, a proper setting was decided.

#### **4.3.2. Setting**

The experiment was conducted in an experimental room at the Department of Interior Architecture and Environmental Design, which serves as a controlled laboratory environment with VR technology. The virtual space's boundaries are defined at the room scale. The most accurate findings regarding the cause and effect can be reached by conducting this kind of experiment in a well-controlled setting. According to Coolican (1998), artificial conditions are required in research to isolate a hypothesized effect. As a result, the laboratory-style experiment is the best method for testing the study's hypotheses. Proper product choice was decided to test the hypotheses in this controlled environment.

#### **4.3.3. Product Choice for the Experiment**

A handbag is used as a product on the displays to test the hypotheses in the experiment. Handbags are typically ideal for luxury brand consumers who like to express their wealth symbolically and young consumers looking for a sense of belonging (Piacentini & Mailer, 2004; Hung et al., 2011). According to Thomas (2007), handbags are

significant products for the luxury brands. Therefore, handbags on a high-image merchandise display are the most appropriate products for this study to assess consumers' impulse buying behavior. As a result, a handbag is a salient product that is especially relevant to the current research goals since it may provide a variety of functional, experiential, and symbolic meanings in terms of wealth, status, and identity (Hung et al., 2011).

Moreover, size is not a significant factor for handbags as opposed to shoes and apparel (Logkizidou, 2016). This finding enables consumers to perceive the cues provided by the stimuli appropriately and control any other factors. Furthermore, consumers usually perceive the price as a helpful external cue (Olson, 1977). As a result, consumers base their opinions about a product's quality on its price. Therefore, this study's participants needed access to information about the product's price. Price judgments are typically influenced by an individual's occupation, income, or level of financial power (Logkizidou, 2016). Hence, price-related information was excluded for the handbags, and its impact on participants' impulse buying behavior was disregarded. After deciding on the proper product, the stimuli were designed for the experiment.

#### **4.3.4. Stimuli Design**

The experiment's stimuli were designed to investigate the effect of visual cues on participants' impulse buying behavior. First, the visual cues suggested in the literature are reviewed, and specific cues from this typology that indicate H-IVS and L-IVS are used to create the proper stimuli. The categorization of the identified visual cues is based on the qualitative typology offered by Logkizidou (2021). This study's typology consists of three visual cues: organization/density, staging technique, and lighting. These three cues were mainly classified as elements related to the store environment.

Next, the stimuli for three H-IVS and three L-IVS scenes were created, so six were designed. The study used custom-created VR stimuli representing H-IVS and L-IVS to immerse participants in a controlled virtual retail environment. This retail environment is determined as a luxury handbag store that sells handbags and shoes. The design of the store was created by examining similar store designs. Thus, a unique store design

was aimed to ensure that all participants experienced this virtual store for the first time (Figure 9). Since it was not aimed to show the brand to the participants, no product or design element was used in the store to indicate the brand. The store was designed with minimal elements, symbolizing luxury (Moore et al., 2010), so participants could pay attention only to the intended stimulus.

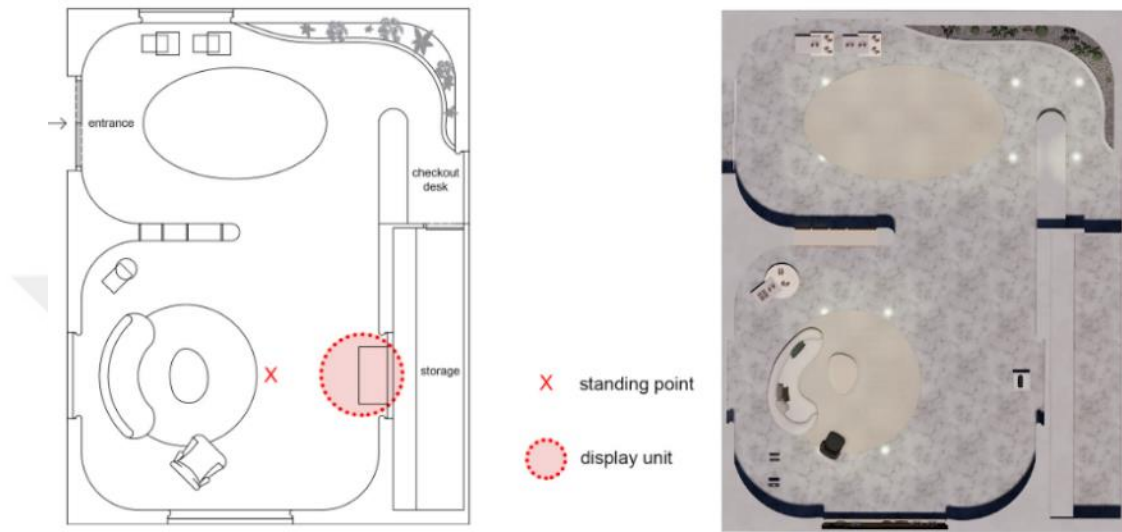


**Figure 9.** Store Layout, drawn by the author (2025)

The store was designed to be prominent in square meters and have plenty of unfurnished space (Figure 10). Thus, the store was designed to be 200 square meters. The product used in the scenes was a handbag, so a handbag model matched its real-world counterpart with hidden identification signs. Customarily, regular display units were used as a display element. Also, a display organization with low product density was achieved. In retail environments, the term luxury is strongly linked to the exclusivity of the products and refined aesthetics of the store ambiance. Low product density, high-end materials, and arranged displays are all characteristics of luxury retail environments (Turley & Milliman, 2000). Therefore, it was ensured that the designed store was suitable for a luxury retail environment. Perceptions of product scarcity and luxury refer to the number of products per square foot on display (Kerfoot et al., 2003; Logkizidou, 2016). Therefore, the number of products per square meter is kept as low as possible.



**Figure 10.** Isometric View of the Store, drawn by the author (2025)

Since there are multiple visual cues, various scenes within the same store were designed. The floor plan was created using AutoCAD 2021, and the stimuli models were developed using SketchUp 2024 and Enscape 4.1. Realistic 3D models, textures, and lighting effects were incorporated into each 3D environment. Panoramic renders of each scene were created to enable participants to experience these scenes through the 360-degree panoramic virtual tours. Moreover, when they put on the VR glasses, they gained a first-person perspective and embraced the environment more. While designing a scene related to one variable, other variables were controlled. The visual cues were systematically manipulated within the VR environments based on the experimental conditions. Utilizing an identical handbag in each condition allowed it to keep product-related aspects and ensure that any variations in consumer behavior were related to manipulating the visual cues. Therefore, participants demonstrated their impulse buying behavior after exposure to display cues during the experiment. Each scene's design elements and manipulated variables are explained in detail below.

### *Scene I: Organization/Density*

As mentioned in the previous literature (Kerfoot et al., 2003; Sevilla & Townsend, 2016), in the H-IVS scene created for organization and density, only one handbag was displayed to demonstrate that the store and brand image are valuable. According to the literature, the space-to-product ratio, which relates to the amount of space assigned to a product in a retail environment, affects consumer views on value and store prestige (Sevilla & Kahn, 2016). Consumers may perceive products and the store as more valuable when the space-to-product ratio increases. Therefore, a handbag was placed neatly in a larger display unit for this scene by referring to the space-to-product ratio. On the other hand, for the scene created for the L-IVS, unlike the different scenes, more products are displayed on a smaller display unit in a messy and unorganized way (Figure 11). The size of the display unit has changed; it became smaller, and the products has increased.



High-image Visual Stimulus



Low-image Visual Stimulus

**Figure 11.** Scene I: Organization/Density of High-image and Low-image Visual Stimuli, drawn by the author (2025)

### *Scene II: Staging Technique*

Museological staging techniques were used to design scenes for the staging technique to give the displayed product a sense of luxury by referencing the art world (Logkizidou et al., 2019) for the H-IVS scene. Museological staging techniques were

achieved with a pedestal block holding the product covered with a glass case. Therefore, glass cases increase consumers' curiosity about the 'treasure' hidden behind the translucent glass (Dion & Arnould, 2011; Kerfoot et al., 2003). For this scene, storytelling (Dion & Arnould, 2011; Hollenbeck et al., 2008) was also used to increase perceptions of the originality and quality of brands. A screen that describes the product's manufacturing process was used in the background of the handbag. Therefore, these technologies and specialized display elements make it easier to teach consumers while displaying the products (Vukadin et al., 2016). There was no glass-covered case or pedestal for the L-IVS scene. Unlike the museological staging technique, a regular single-shelf unit displayed the handbag. Moreover, in contrast to technological staging, video screens were not used for this scene (Figure 12).



High-image Visual Stimulus



Low-image Visual Stimulus

**Figure 12.** Scene II: Staging Technique of High-image and Low-image Visual Stimuli, drawn by the author (2025)

### *Scene III: Lighting*

According to previous literature, accent lighting was a significant design element for the H-IVS (Dion & Arnould, 2011; Logkizidou et al., 2019), so accent lighting was used to focus light on the product for the H-IVS scene. In addition, a warm white color was achieved by using incandescent spotlights. Cool white fluorescent strip lighting (Kerfoot et al., 2003) was used for the L-IVS scene. Therefore, ambient lighting with a general focus was used (Figure 13).



High-image VMD



Low-image VMD

**Figure 13.** Scene III: Lighting of High-image and Low-image Visual Stimuli,  
drawn by the author (2025)

#### 4.3.5. Instruments

Several instruments were used in the study to test the designed scenes. First, approval from the Bilkent ethics committee was obtained. The ethics committee at Bilkent University provided approval to work with Bilkent students before the experiment started (İAEK\_2024\_09\_27\_01). The committee received a document explaining the study's objectives, methodology, participants, instruments, and procedure. The ethics committee approves all research procedures (see Appendix B). Next, the tools, measures, and scales were decided to use in the experiment.

##### 4.3.5.1. Tools

This study used the HTC Vive Pro VR equipment and a VR-ready computer system as virtual environment tools. The HTC Vive Pro VR equipment is a head-mounted display consisting of a headset, two wireless controllers, and two sensors (see Appendix C). Participants used the headset to experience virtual environments (VE), which provided ideal VR visuals and interactive features.

#### **4.3.5.2. Measures and Scales**

##### *Visual Merchandising Display Cues Scale (VMDCS)*

A scale for each visual cue (organization/density, staging technique, lighting) was created to assess the perceived impact of each visual stimulus (H-IVS and L-IVS) on participants' impulse buying behavior (see Appendix D). The endpoints were labeled 'low' and 'high,' and the response scale for each item comprised seven categories. The scale asks participants to rate the impact of each visual cue on their impulse buying behavior.

##### *Demographic Questionnaire*

The Demographic Questionnaire (see Appendix E) also addressed the participants' demographic characteristics. It covered their age, gender, education level, major, shopping frequency, and annual household income.

##### *Technology Familiarity Test (TFT)*

The TFT (see Appendix F), developed by O'Brien et al. (2015) and adapted from Özgen (2018), was used to assess the technology familiarity of the participants. The scale includes details about the participants' VR experiences.

##### *Impulse Buying Tendency Scale (IBTS)*

A scale developed by Verplanken and Herabadi (2001) was used to assess the impulse-buying tendency of the participants. As they refer to cognitive and affective aspects, using this scale was proper for the study. The scale is evaluated and comprises ten cognitive and affective indicators of IBT. The initial wording of the 20-item instrument was proposed by Verplanken and Herabadi (2001) (see Appendix G). The coefficient alpha for the two sub-scales was 0.91 for the cognitive states, 0.83 for the affective states, and 0.86 for the complete scale. The endpoints were labeled 'fully agree' and 'fully disagree'. The response scale for each item comprised seven categories.

These scales allow an in-depth analysis of the effects of H-IVS and L-IVS on impulse buying behavior across the three different element categories in an immersive VR environment. Table 5 summarizes the survey instruments used in this study.

**Table 5.** Summary of survey instruments used to assess participants' responses, drawn by the author (2025)

|   | Measured Variables                | Survey                                  | Reference                    |
|---|-----------------------------------|-----------------------------------------|------------------------------|
| 1 | Visual Merchandising Display Cues | Visual Merchandising Display Cues Scale | Developed by the researcher  |
| 2 | Demographic Variables             | Demographic Questionnaire               | Developed by the researcher  |
| 3 | Technology Familiarity            | Technology Familiarity Test             | O'Brien et al. (2015)        |
| 4 | Impulse Buying Tendency           | Impulse Buying Tendency Scale           | Verplanken & Herabadi (2001) |

All steps of the study were followed according to a procedure.

#### 4.4. Procedure

During the study, one instructor coordinated the participants' experiments. The participants were randomly assigned to an H-IVS and an L-IVS. Therefore, two comparison groups explored and interacted with the displays in the VR exposure step: The H-IVS group and the L-IVS group (Figure 14). Using the available tools, each participant joined the experiment individually. There was a pre-screening process for participants, so any conditions that could be adversely affected by VR, such as epilepsy, could be identified. Also, all participants were informed about potential side effects of VR use, even if they are less significant, such as motion sickness or eye strain, so they were fully aware of the risks.

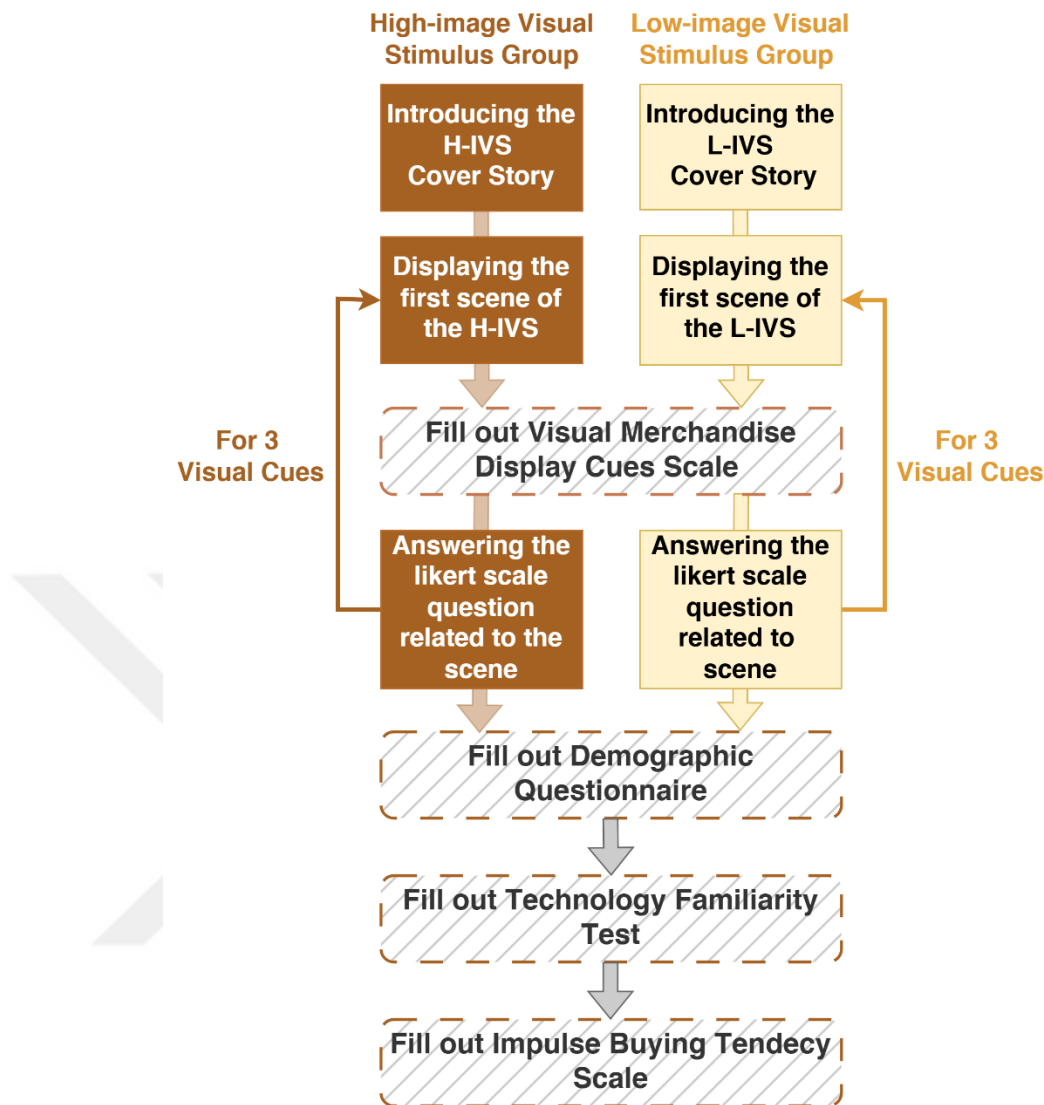


**Figure 14.** Flow Chart of the Procedure, drawn by the author (2025)

For the H-IVS group, the H-IVS cover story is introduced first (see Appendix H). In the cover story, the participants were asked to contribute to comprehending consumer attitudes regarding a luxury brand of handbags that was newly introduced to the market. According to the story, VR settings were made available to provide them with the company's product, since it was uncertain that the participants were familiar with the brand. Thus, a handbag from an unknown brand with concealed identifying marks was used. Participants were also asked to remember their social status and think they could afford anything to eliminate it.

Next, they were asked to wear VR glasses (Figure 15), and the first scene of the H-IVS was displayed to the participants.



**Figure 15.** Participants in the experiment with VR glasses

They experienced these scenes through the 360-degree panoramic virtual tours (see Appendix I and Figure 16). A probabilistic ranking was provided using Qualtrics to rank the scenes. According to the previous literature (Kim & Lee, 2021), the exposure duration of each visual stimulus was determined to be 30 seconds. During the

experiment, participants asked to evaluate the impact of visual cues on their impulse buying behavior using the VMDCS related to the high-image cue shown in the scene while still in VR; the investigator addressed the participant with the items of the scale and took notes of their answers. These steps were repeated for three different high-image visual cues.



**Figure 16.** 360-degree Panoramic View of the Store, drawn by the author (2025)

Then, participants completed the Demographic Questionnaire, which covers their age, gender, education level, major, shopping frequency, annual household income, and TFT. They were also asked to complete the Impulse Buying Tendency Scale (IBTS) to evaluate their IBT. The same steps were repeated for the L-IVS group. The study procedure continued with the data analysis step.

#### **4.5. Data Analysis**

The Statistical Package for the Social Sciences (SPSS) 26.0 Statistics software program analyzed the data. The age and scale scores for normal distribution were determined according to the skewness and kurtosis values (Table 6) (see Appendix J). All numerical values comply with standard distribution rules except age. The values for skewness and kurtosis between -2 and +2 are considered acceptable to demonstrate normal univariate distribution (George & Mallery, 2010). Hair et al. (2010) argued that data is standard if skewness is between -2 and +2 and kurtosis is between -7 and +7.

**Table 6.** Skewness and Kurtosis Values for Numerical Data

| <i>Scales</i>                 | <i>Skewness (<math>\pm S.E</math>)</i> |      | <i>Kurtosis (<math>\pm S.E</math>)</i> |      |
|-------------------------------|----------------------------------------|------|----------------------------------------|------|
| Impulse Buying Behavior       | 0.15                                   | 0.26 | -0.39                                  | 0.52 |
| Organization/ Density         | 0.35                                   | 0.26 | -0.89                                  | 0.52 |
| Staging Techniques            | -0.63                                  | 0.26 | -0.16                                  | 0.52 |
| Lighting                      | -0.14                                  | 0.26 | -0.86                                  | 0.52 |
| Impulse Buying Tendency Scale | -0.04                                  | 0.26 | -0.34                                  | 0.52 |
| Cognitive States              | 0.07                                   | 0.26 | -0.47                                  | 0.52 |
| Affective States              | -0.11                                  | 0.26 | -0.14                                  | 0.52 |

*S.E.: Standard Error*

Chi-square analysis compared individuals' socio-demographic information and technology familiarity findings in the H-IVS and L-IVS groups. The Mann-Whitney U test was used to compare the ages of individuals in the H-IVS and L-IVS groups. At the same time, the independent samples t-test was employed to compare the data on visual stimuli and impulse buying behaviors. A two-way unrelated ANOVA was used to show the effect of visual cues and visual stimulus groups on impulse buying behavior. A linear regression analysis examined whether IBTs' cognitive and affective aspects mediate the relationship between visual stimuli and impulse buying behavior. Pearson correlation analysis was conducted to investigate the relationship between the scales. The correlation coefficient was evaluated, as shown in Table 7. Throughout the study, significance levels were considered at 0.05 and 0.01.

**Table 7.** Range of Correlation Coefficient Values, Meghanathan (2016)

| <i>Range of Correlation Coefficient Values</i> | <i>Level of Correlation</i> |
|------------------------------------------------|-----------------------------|
| 0.80 to 1.00                                   | Very Strong                 |
| 0.60 to 0.79                                   | Strong                      |
| 0.40 to 0.59                                   | Moderate                    |
| 0.20 to 0.39                                   | Weak                        |
| 0.00 to 0.19                                   | Very Weak                   |

Data gathered from these scales was generally examined and evaluated during this phase. The following chapter covers the study's results and statistical analysis and answers the study's research questions.

## CHAPTER V

### RESULTS

#### 5.1. Descriptive Analysis

##### 5.1.1. Socio-Demographic Information of Individuals in High- and Low-Image Visual Stimulus Groups

Eighty-four individuals participated in the study, 42 in the H-IVS group and 42 in the L-IVS group. Tables 8 and 9 present the socio-demographic information of individuals in both groups.

**Table 8.** Socio-Demographic Information of Individuals in High- and Low-Image Visual Stimulus Groups

| <i>Variables</i>   |                 | <i>Low-Image<br/>(n=42)</i> |          | <i>High-Image<br/>(n=42)</i> |          | <i>Test Statistic</i> |
|--------------------|-----------------|-----------------------------|----------|------------------------------|----------|-----------------------|
|                    |                 | <i>Count</i>                | <i>%</i> | <i>Count</i>                 | <i>%</i> |                       |
| Education Level    | Under graduate  | 34                          | 81.0     | 39                           | 92.9     | $\chi^2=1.674$        |
|                    | Graduate        | 8                           | 19.0     | 3                            | 7.1      | p=0.196               |
| Major              | Social Sciences | 10                          | 23.8     | 11                           | 26.2     | $\chi^2=1.794$        |
|                    | Sciences        | 4                           | 9.5      | 1                            | 2.4      | p=0.384               |
|                    | Other           | 28                          | 66.7     | 30                           | 71.4     |                       |
| Monthly Bag0       |                 | 6                           | 14.3     | 2                            | 4.8      | $\chi^2=3.911$        |
| Shopping Frequency | 1               | 11                          | 26.2     | 18                           | 42.9     | p=0.271               |
|                    | 2               | 13                          | 31.0     | 12                           | 28.6     |                       |
|                    | 3 or more       | 12                          | 28.6     | 10                           | 23.8     |                       |

Continued on next page

Table 8 Continued

|                |                     | <i>Low-Image</i><br>( <i>n</i> =42) |          | <i>High-Image</i><br>( <i>n</i> =42) |          | <i>Test Statistic</i> |
|----------------|---------------------|-------------------------------------|----------|--------------------------------------|----------|-----------------------|
|                |                     | <i>Count</i>                        | <i>%</i> | <i>Count</i>                         | <i>%</i> |                       |
| Monthly Income | No Response         | 0a                                  | 0.0      | 6b                                   | 14.3     | $\chi^2=9.109$        |
|                | 0-49.000 ₺          | 9a                                  | 21.4     | 11a                                  | 26.2     | <b>p=0.028*</b>       |
|                | 50.000-99.000 ₺     | 18a                                 | 42.9     | 18a                                  | 42.9     |                       |
|                | 100,000 ₺ and above | 15a                                 | 35.7     | 7b                                   | 16.7     |                       |
|                |                     |                                     |          |                                      |          |                       |

\* $p<0.05$ , \*\* $p<0.01$ ,  $\chi^2$ : Chi-Square Test (Categorical data),  $z$ : Mann-Whitney U Test. Lettering: Benferroni Test.

Chi-square analysis showed the individuals' socio-demographic information in the H-IVS and L-IVS groups (see Appendix K). According to this table, the education level, major, and monthly bag shopping frequency distributions of individuals in the H-IVS and L-IVS groups were similar ( $p>0.05$ ). Regarding education level, 81% of individuals in the L-IVS group were undergraduate graduates, and 19% had pursued graduate-level education. The H-IVS group, these proportions were 92.9% and 7.1%, respectively. In the distribution of majors, 23.8% of participants in the L-IVS were from Social Sciences, 9.5% were from Sciences, and 66.7% were from other fields. In the H-IVS group, these percentages were 26.2%, 2.4%, and 71.4%, respectively. Regarding monthly shopping frequency, 14.3% of individuals in the L-IVS group reported not shopping at all, 26.2% shopped once, 31% shopped twice, and 28.6% shopped three or more times. In the H-IVS group, these rates were 4.8%, 42.9%, 28.6%, and 23.8%, respectively. The monthly income distributions of individuals in the H-IVS and L-IVS groups showed significant differences ( $\chi^2(3)=9.11$ ,  $p<0.028$ ). According to these findings, there were no participants in the L-IVS (0%) in the no-response category, while 14.3% of participants in the H-IVS group fell into this category. In the 100,000 ₺ and above category, 35.7% of participants in the L-IVS group were represented, compared to 16.7% in the H-IVS.

**Table 9.** Age Distribution of Individuals in High- and Low-Image Visual Stimulus Groups

|                  | <i>Mean ± SD</i><br><i>Median (Min-Max)</i> | <i>Mean ± SD</i><br><i>Median (Min-Max)</i> | <i>p</i>                            |
|------------------|---------------------------------------------|---------------------------------------------|-------------------------------------|
| Age <sup>z</sup> | 21.69±3.47<br>21(18-33)                     | 20.88±1.92<br>21(19-26)                     | <i>z</i> =-0.498<br><i>p</i> =0.618 |

\**p*<0.05, \*\**p*<0.01,  $\chi^2$ : Chi-Square Test (Categorical data), *z*: Mann-Whitney U Test. Lettering: Benferroni Test.

The Mann-Whitney U Test was used to demonstrate the ages of individuals in the H-IVS and L-IVS groups (see Appendix L). The average ages of individuals in the H-IVS and L-IVS groups did not significantly differ (*p*>0.05). The median age for both groups was 21.

### 5.1.2. Technology Familiarity Test Findings of Individuals in High- and Low-Image Visual Stimulus Groups

Table 10 shows the individuals' TFT findings in the H-IVS and L-IVS groups. A chi-square analysis compared the findings of the individuals' technological familiarity in the H-IVS and L-IVS groups (see Appendix M).

**Table 10.** Technology Familiarity Test Findings of Individuals in High- and Low-Image Visual Stimulus Groups

| <i>Technology Familiarity</i> |                         | <i>Low-Image (n=42)</i> |          | <i>High-Image (n=42)</i> |          | <i>Test Statistic</i>             |
|-------------------------------|-------------------------|-------------------------|----------|--------------------------|----------|-----------------------------------|
|                               |                         | <i>Count</i>            | <i>%</i> | <i>Count</i>             | <i>%</i> |                                   |
| Frequency of Computer Use     | Less than 1 hour/week   | 0                       | 0.0      | 1                        | 2.4      | $\chi^2=6.167$<br><i>p</i> =0.076 |
|                               | 1-5 hours/week          | 2                       | 4.8      | 4                        | 9.5      |                                   |
|                               | 5-10 hours/week         | 15                      | 35.7     | 6                        | 14.3     |                                   |
|                               | More than 10 hours/week | 25                      | 59.5     | 31                       | 73.8     |                                   |
| Duration of Computer Use      | Less than 6 months      | 1                       | 2.4      | 1                        | 2.4      | $\chi^2=0.000$<br><i>p</i> =1.000 |
|                               | 6 months - 1 year       | 1                       | 2.4      | 1                        | 2.4      |                                   |
|                               | 1-5 years               | 8                       | 19.0     | 8                        | 19.0     |                                   |
|                               | 5 years and above       | 32                      | 76.2     | 32                       | 76.2     |                                   |

Continued on next page

Table 10 Continued

| <i>Technology Familiarity</i>   |                         | <i>Low-Image (n=42)</i> |          | <i>High-Image (n=42)</i> |          | <i>Test<br/>Statistic</i> |
|---------------------------------|-------------------------|-------------------------|----------|--------------------------|----------|---------------------------|
|                                 |                         | <i>Count</i>            | <i>%</i> | <i>Count</i>             | <i>%</i> |                           |
| Weekly Internet Usage Frequency | 5-10 hours/week         | 2                       | 4.8      | 2                        | 4.8      | $\chi^2=0.000$            |
|                                 | More than 10 hours/week | 40                      | 95.2     | 40                       | 95.2     | $p=1.000$                 |
| Duration of Internet Use        | 1-5 years               | 0                       | 0.0      | 1                        | 2.4      | $\chi^2=0.000$            |
|                                 | 5 years and above       | 42                      | 100.0    | 41                       | 97.6     | $p=1.000$                 |
| VR Use                          | Yes                     | 19                      | 45.2     | 19                       | 45.2     | $\chi^2=0.000$            |
|                                 | No                      | 23                      | 54.8     | 23                       | 54.8     | $p=1.000$                 |
| Weekly VR Usage Frequency       | None                    | 23                      | 54.8     | 23                       | 54.8     | $\chi^2=2.111$            |
|                                 | Less than 1 hour/week   | 17                      | 40.5     | 19                       | 45.2     | $p=0.469$                 |
|                                 | 1-5 hours/week          | 2                       | 4.8      | 0                        | 0.0      |                           |
| Frequency of VR Use             | None                    | 23                      | 54.8     | 23                       | 54.8     | $\chi^2=1.476$            |
|                                 | Less than 6 months      | 12                      | 28.6     | 12                       | 28.6     | $p=0.898$                 |
|                                 | 6 months - 1 year       | 2                       | 4.8      | 1                        | 2.4      |                           |
|                                 | 1-5 years               | 4                       | 9.5      | 3                        | 7.1      |                           |
|                                 | 5 years and above       | 1                       | 2.4      | 3                        | 7.1      |                           |

\* $p<0.05$ , \* $p<0.01$ ,  $\chi^2$ : Chi-square test (Categorical data). VR: Virtual Reality

According to this table, computer and internet usage were reported by 100% of all participants. Regarding the frequency of computer use, 59.5% of participants in the L-IVS group reported using it for more than 10 hours a week, while 73.8% of those in the H-IVS group did. Regarding internet usage duration, the majority reported using it for 5 years or more, with 100% of participants in the L-IVS group and 97.6% in the H-IVS group falling into this category. VR system usage was reported at 45.2% in both groups. For VR usage frequency, most participants in both groups reported no usage (54.8%), and the usage duration was mainly reported as less than 6 months. These findings suggest a similar distribution regarding technology familiarity between individuals in the H-IVS and L-IVS groups ( $p>0.05$ ).

Similar distributions were observed in the preferences for computer usage between the two visual stimulus groups. In the L-IVS group, 61.9% of participants, and in the H-IVS group, 52.4%, used a combination of desktop computers, laptops, and tablets.

Additionally, the proportion of participants who used only laptops in both groups was equal at 14.3%. The tablet usage rate was 0% in the L-IVS group and 4.8% in the H-IVS group. Regarding VR system usage, the most common type in both groups was VR glasses with a mobile phone, with 28.6% of the L-IVS group and 31.0% of the H-IVS group reporting this usage. In the L-IVS group, 7.1% of participants used only the HTC Vive Pro, while it was 4.8% in the H-IVS group. The proportion of participants not using any VR system was 54.8% in both groups. These findings suggest that there are some differences between the groups in terms of technology device usage preferences and VR experiences.

## 5.2. Examination of the Relationships Between Scales in High and Low-Image Visual Stimulus Groups

Table 11 shows the correlation between visual cues and IBT for individuals with L-IVS groups. The results of the correlation analysis conducted within the L-IVS group showed strong relationships between impulse buying behavior and low-image visual cues (see Appendix N).

**Table 11.** Examination of the Relationship Between Scales in the Low-Image Visual Stimulus Group

| <i>L-IVS Group</i> | <i>Cor. Coef.</i> | <i>1. IBB</i>                   | <i>2. O/D</i>   | <i>3. ST</i>   | <i>4. L</i>     | <i>5. IBT</i>                   | <i>6. CS</i>                   | <i>7. AS</i> |
|--------------------|-------------------|---------------------------------|-----------------|----------------|-----------------|---------------------------------|--------------------------------|--------------|
| 1. IBB             | r<br>p            | 1                               |                 |                |                 |                                 |                                |              |
| 2. O/D             | r<br>p            | <b>0.605**</b><br><b>0.0001</b> | 1               |                |                 |                                 |                                |              |
| 3. ST              | r<br>p            | <b>0.638**</b><br><b>0.0001</b> | 0.014<br>0.928  | 1              |                 |                                 |                                |              |
| 4. L               | r<br>p            | <b>0.746**</b><br><b>0.0001</b> | 0.183<br>0.246  | 0.282<br>0.07  | 1               |                                 |                                |              |
| 5. IBT             | r<br>p            | -0.013<br>0.934                 | 0.0001<br>1.000 | 0.031<br>0.843 | -0.055<br>0.73  | 1                               |                                |              |
| 6. CS              | r<br>p            | -0.072<br>0.649                 | -0.082<br>0.607 | 0.036<br>0.822 | -0.094<br>0.555 | <b>0.906**</b><br><b>0.0001</b> | 1                              |              |
| 7. AS              | r<br>p            | 0.052<br>0.742                  | 0.087<br>0.585  | 0.020<br>0.898 | -0.002<br>0.989 | <b>0.893**</b><br><b>0.0001</b> | <b>0.617**</b><br><b>0.001</b> | 1            |

\* $p < 0.05$ , \*\* $p < 0.01$ . *r*: Correlation coefficient, *IBB*: Impulse Buying Behavior Visual Merchandising Display Cues Scale; *O/D*: Organization/Density; *ST*: Staging Techniques; *L*: Lighting; *IBT*: Impulse Buying Tendency Scale; *CS*: Cognitive States; *AS*: Affective States; *L-IVS*: Low-image Visual Stimulus

Impulse buying behavior was strongly correlated with lighting ( $r=0.746$ ,  $p=0.0001$ ), staging techniques ( $r=0.638$ ,  $p=0.0001$ ), and organization/density ( $r=0.605$ ,  $p=0.0001$ ). However, no significant relationship was found between impulse buying behavior and the IBT. Furthermore, there are no significant correlations between impulse buying behavior and cognitive and affective states ( $p>0.05$ ). A positive correlation was observed between cognitive states and the IBT ( $r = 0.906$ ,  $p = 0.0001$ ) and between affective states and the IBT ( $r = 0.893$ ,  $p = 0.0001$ ). A strong positive relationship was found between cognitive and affective states ( $r = 0.617$ ,  $p = 0.0001$ ). Table 12 shows the correlation between the visual cues and the IBT of individuals in the H-IVS group.

**Table 12.** Examination of the Relationship Between Scales in the High-Image Visual Stimulus Group

| <i>H-IVS Group</i> | <i>Cor. Coef.</i> | <i>1. IBB</i>                   | <i>2. O/D</i>                   | <i>3. ST</i>                  | <i>4. L</i>     | <i>5. IBT</i>                  | <i>6. CS</i>                  | <i>7. AS</i> |
|--------------------|-------------------|---------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------------|-------------------------------|--------------|
| 1. IBB             | r<br>p            | 1                               |                                 |                               |                 |                                |                               |              |
| 2. O/D             | r<br>p            | <b>0.767**</b><br><b>0.0001</b> | 1                               |                               |                 |                                |                               |              |
| 3. ST              | r<br>p            | <b>0.684**</b><br><b>0.0001</b> | 0.181<br>0.251                  | 1                             |                 |                                |                               |              |
| 4. L               | r<br>p            | <b>0.832**</b><br><b>0.0001</b> | <b>0.548**</b><br><b>0.0001</b> | <b>0.380*</b><br><b>0.013</b> | 1               |                                |                               |              |
| 5. IBT             | r<br>p            | -0.026<br>0.872                 | -0.08<br>0.613                  | 0.027<br>0.863                | -0.001<br>0.993 | 1                              |                               |              |
| 6. CS              | r<br>p            | -0.022<br>0.889                 | -0.054<br>0.734                 | -0.033<br>0.834               | 0.043<br>0.789  | <b>0.805*</b><br><b>0.0001</b> | 1                             |              |
| 7. AS              | r<br>p            | -0.019<br>0.904                 | -0.076<br>0.632                 | 0.076<br>0.631                | -0.044<br>0.784 | <b>0.817*</b><br><b>0.0001</b> | <b>0.316*</b><br><b>0.042</b> | 1            |

\* $p<0.05$ , \*\* $p<0.01$ . *r*: Correlation coefficient, *IBB*: Impulse Buying Behavior; *OD*: Organization/Density; *ST*: Staging Techniques; *L*: Lighting; *IBT*: Impulse Buying Tendency; *CS*: Cognitive States; *AS*: Affective States; *H-IVS*: High-image Visual Stimulus

According to the correlation analysis conducted within the H-IVS, significant positive relationships were found between impulse buying behavior and high-image visual cues. A powerful positive relationship was found between impulse buying behavior and

lighting ( $r = 0.832, p = 0.0001$ ). A strong positive relationship exists between impulse buying behavior, organization/density ( $r = 0.767, p = 0.0001$ ), and staging techniques ( $r = 0.684, p = 0.0001$ ). Additionally, a moderate positive relationship was observed between the lighting and organization/density ( $r = 0.548, p = 0.0001$ ), and a weak positive relationship was observed between the lighting and staging techniques ( $r = 0.380, p = 0.013$ ).

No significant relationship was found between the IBT and the impulse buying behavior or visual cues ( $p > 0.05$ ). However, powerful positive relationships were observed between the IBT and cognitive states ( $r = 0.805, p = 0.0001$ ) and affective states ( $r = 0.817, p = 0.0001$ ). A weak positive relationship exists between cognitive and affective states ( $r = 0.316, p = 0.042$ ).

### 5.3. The Effect of Visual Stimulus Groups on Impulse Buying Behavior and Personality Traits

An independent sample t-test was used to compare visual stimulus groups and analyze whether their effects on impulse buying behavior and personality traits differ. Below, the VMDCS and IBTS findings for individuals in the H-IVS and L-IVS groups are compared.

#### 5.3.1. The Effect of Visual Stimulus Groups on Visual Cues

The reliability results for the VMDCS are presented in Table 13. When examining reliability coefficients based on correlation values, scales are considered unreliable between 0.00 and 0.40, low between 0.40 and 0.60, reliable between 0.60 and 0.80, and highly reliable between 0.80 and 1.00 (Karagöz, 2021).

**Table 13.** Reliability Analysis Results for VMDCS

| <i>Factors</i>                          | <i>Cronbach's Alpha</i> | <i>N</i> |
|-----------------------------------------|-------------------------|----------|
| Visual Merchandising Display Cues Scale | 0.600                   | 3        |

*S.E.: Standard Error*

According to Table 13, the VMDCS's Cronbach's Alpha value is 0.600, which is reliable. Moreover, Table 14 and Figure 17 compare the VMDCS findings for

individuals in the H-IVS and L-IVS groups. The independent samples t-test was employed to compare the data on visual cues and impulse buying behaviors (see Appendix O).

**Table 14.** Comparison of the Findings of the Visual Merchandising Display Cues Scale for Individuals in the High- and Low-Image Visual Stimulus Groups

|                          | <i>Low-Image<br/>(n=42)<br/>Mean ± SD</i> | <i>High-Image<br/>(n=42)<br/>Mean ± SD</i> | <i>t</i> | <i>df</i> | <i>p</i>        |
|--------------------------|-------------------------------------------|--------------------------------------------|----------|-----------|-----------------|
| Impulse Buying Behavior  | 3.30 ± 1.02a                              | 4.51 ± 1.05b                               | -5.34    | 82        | <b>0.0001**</b> |
| Organization/<br>Density | 2.74 ± 1.55a                              | 3.48 ± 1.45b                               | -2.25    | 82        | <b>0.027*</b>   |
| Staging<br>Techniques    | 4.21 ± 1.49a                              | 5.05 ± 1.40b                               | -2.65    | 82        | <b>0.010**</b>  |
| Lighting                 | 2.95 ± 1.59a                              | 5.00 ± 1.29b                               | -6.48    | 82        | <b>0.0001**</b> |

\* $p < 0.05$ , \*\* $p < 0.01$ , Test Statistics: Independent Sample T Test

According to the independent samples t-test results, there were significant differences between H-IVS and L-IVS groups in the impulse buying behavior and visual cues ( $p < 0.05$ ). The impulse buying behavior score of the scale was significantly higher in the H-IVS ( $M=4.51$ ,  $SD=1.05$ ) compared to the L-IVS ( $M=3.30$ ,  $SD=1.02$ ),  $t(82) = -5.34$ ,  $p=0.0001$ . Similarly, in the organization/density, the score of the H-IVS group ( $M=3.48$ ,  $SD=1.45$ ) was significantly higher than that of the L-IVS group ( $M = 2.74$ ,  $SD = 1.55$ ),  $t(82)=-2.25$ ,  $p=0.027$ .

Additionally, in the staging techniques, the H-IVS group ( $M=5.05$ ,  $SD=1.40$ ) also scored significantly higher than the L-IVS group ( $M=4.21$ ,  $SD=1.49$ ),  $t(82) = -2.65$ ,  $p=0.010$ . Finally, in the lighting, the score of the H-IVS group ( $M=5.00$ ,  $SD=1.29$ ) was significantly higher than that of the L-IVS group ( $M=2.95$ ,  $SD=1.59$ ),  $t(82)=-6.48$ ,  $p=0.0001$ . These findings indicate that the individuals in the H-IVS group evaluated the impulse buying behavior more positively across all dimensions than the L-IVS group.

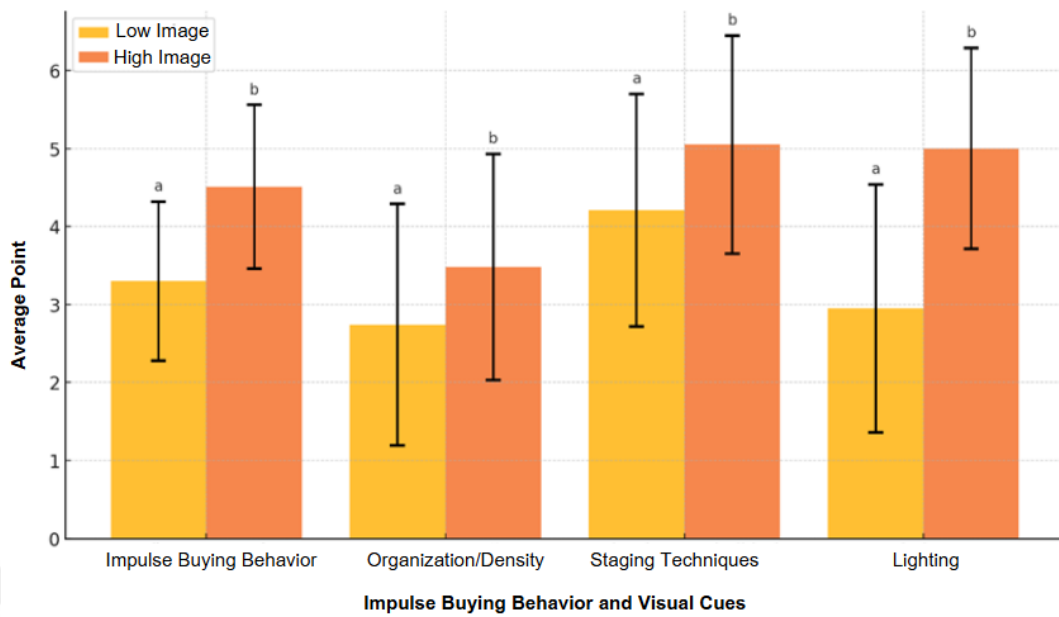


**Figure 17.** Scores of the Visual Merchandising Display Cues Scale and Visual Cues for Individuals in the High- and Low-image Groups, drawn by the author (2025)

The figure above compares the average scores for H-IVS and L-IVS groups across the impulse buying behavior and visual cues: Organization/Density, Staging Techniques, and Lighting. Across all dimensions, H-IVS received a significantly higher average score compared to L-IVS. Therefore, there is a significant difference between the two groups.

### 5.3.2. The Effect of Visual Stimulus Groups on Personality Traits

The reliability results for the IBTS and its sub-factors are presented in Table 15. When examining reliability coefficients based on correlation values, scales are considered unreliable between 0.00 and 0.40, low between 0.40 and 0.60, reliable between 0.60 and 0.80, and highly reliable between 0.80 and 1.00 (Karagöz, 2021). The personality traits show a Cronbach's Alpha value of 0.869, which is high. The reliability coefficient for the Cognitive States is 0.846, which also indicates high reliability. Finally, with a Cronbach's Alpha value of 0.795, the Affective States is classified as reasonably reliable.

**Table 15.** Reliability Analysis Results for IBTS

| <i>Factors</i>     | <i>Cronbach's Alpha</i> | <i>N</i> |
|--------------------|-------------------------|----------|
| Personality Traits | 0.869                   | 20       |
| Cognitive States   | 0.846                   | 10       |
| Affective States   | 0.795                   | 10       |

*S.E.: Standard Error*

Overall, this study found the reliability of all scales and their sub-factors sufficient. Moreover, Table 16 compares findings on the personality traits for individuals in the H-IVS and L-IVS groups. According to the results of the independent sample t-test, no statistically significant difference was found between the H-IVS and L-IVS groups in the personality traits and cognitive and affective states ( $p>0.05$ ) (see Appendix O).

**Table 16.** Comparison of Findings Related to the Personality Traits for Individuals in the High- and Low-image Visual Stimulus Groups

|                    | <i>Low-Image<br/>(n=42)</i> | <i>High-Image<br/>(n=42)</i> |          |           |          |
|--------------------|-----------------------------|------------------------------|----------|-----------|----------|
|                    | <i>Mean ± SD</i>            | <i>Mean ± SD</i>             | <i>t</i> | <i>df</i> | <i>p</i> |
| Personality Traits | 3.77 ± 1.01a                | 4.03 ± 0.73a                 | -1.35    | 82        | 0.181    |
| Cognitive States   | 3.56 ± 1.16a                | 3.85 ± 0.89a                 | -1.26    | 82        | 0.211    |
| Affective States   | 3.97 ± 1.09a                | 4.21 ± 0.91a                 | -1.08    | 82        | 0.285    |

*\*p<0.05, \*\*p<0.01, Test Statistic: Independent Sample T-Test.*

Although the total score of the personality traits was higher in the H-IVS group (M=4.03, SD=0.73) compared to the L-IVS group (M=3.77, SD=1.01), the difference was not significant ( $p>0.05$ ). Similarly, in the cognitive states, the H-IVS group's score (M=3.85, SD=0.89) was higher than that of the L-IVS group (M=3.56, SD=1.16). Still, the difference was insignificant ( $p>0.05$ ).

In the affective states, the H-IVS group (M=4.21, SD=0.91) also scored higher than the L-IVS group (M=3.97, SD=1.09), but the difference was not significant ( $p>0.05$ ). These findings indicate that the personality traits and their sub-scales do not differ significantly between the H-IVS and L-IVS groups. While the differences were not statistically significant, it can be stated that individuals in the H-IVS group had higher scores on the personality traits and the cognitive and affective States compared to those in the L-IVS group.

## 5.4. Examination of the Effects of Visual Stimulus Groups and Visual Cues on Impulse Buying Behavior

A two-way unrelated ANOVA (see Appendix P) examines the effects of H-IVS and L-IVS groups and visual cues on impulse buying behavior (Table 17). It tests between-subjects effects on impulse buying behavior across visual stimulus groups and visual cues.

**Table 17.** Tests of Between-Subjects Effects on Impulse Buying Behavior

| <i>Source</i>                      | <i>SS</i>            | <i>df</i> | <i>MS</i> | <i>F</i> | <i>p</i> | $\eta^2$ |
|------------------------------------|----------------------|-----------|-----------|----------|----------|----------|
| Corrected Model                    | 212.238 <sup>a</sup> | 5         | 42.448    | 19.796   | <.001    | .287     |
| Intercept                          | 3842.286             | 1         | 3842.286  | 1791.934 | <.001    | .879     |
| Visual Stimulus Group              | 91.683               | 1         | 91.683    | 42.758   | <.001    | .148     |
| Visual cue                         | 98.167               | 2         | 49.083    | 22.891   | <.001    | .157     |
| Visual Stimulus Group * Visual cue | 22.389               | 2         | 11.194    | 5.221    | .006     | .041     |
| Error                              | 527.476              | 246       | 2.144     |          |          |          |
| Total                              | 4582.000             | 252       |           |          |          |          |
| Corrected Total                    | 739.714              | 251       |           |          |          |          |

*a. R Squared = .287 (Adjusted R Squared = .272) Dependent variable: IBB; SS: Sum of Squares; df: degrees of freedom; MS: Mean Square; F: F-value; p: significance value.*

According to the table, the corrected model was significant ( $F(5, 246) = 19.796$ ,  $p < 0.001$ ,  $\eta^2 = 0.287$ ), indicating that the independent variables collectively explained 28.7% of the variance in impulse buying behavior. The main effect of the visual stimulus group was significant for impulse buying behavior ( $F(1, 246) = 42.758$ ,  $p < 0.001$ ,  $\eta^2 = 0.148$ ), showing that H-IVS and L-IVS groups significantly have an impact on impulse buying behavior.

The main effect of visual cues was also significant for impulse buying behavior ( $F(2, 246) = 22.891$ ,  $p < 0.001$ ,  $\eta^2 = 0.157$ ), suggesting that these visual cues have a significant impact on impulse buying behavior. The interaction of the visual stimulus

and visual cues was also significant ( $F(2, 246) = 5.221, p = 0.006, \eta^2 = 0.041$ ), showing that the effect of organization/density, staging, and lighting on impulse buying behavior varies based on the H-IVS and L-IVS groups. Table 18 shows the effect sizes for ANOVA according to Cohen's (1988) guidelines.

**Table 18.** Effect Sizes for ANOVA

| <i>Effect Size</i> | <i><math>\eta^2</math> (Partial Eta Squared)</i> |
|--------------------|--------------------------------------------------|
| Small effect       | $\eta^2 = 0.01$                                  |
| Medium effect      | $\eta^2 = 0.06$                                  |
| Large effect       | $\eta^2 = 0.14$                                  |

Comparing the effect size of the variables, the visual stimulus group ( $\eta^2 = 0.148$ ) and visual cues ( $\eta^2 = 0.157$ ) have a larger effect on impulse buying behavior, and visual cues have a slightly more substantial impact than the high-image vs. low-image distinction. The interaction of the visual stimulus group and visual cues ( $\eta^2 = 0.041$ ) has a small to medium effect on impulse buying behavior. This suggests that the impact of visual cues on impulse buying behavior varies slightly between the H-IVS and L-IVS groups, though the difference is insignificant. In other words, impulse buying behavior is influenced by organization/density, lighting, and staging; however, their effect is only slightly affected by the group's high-image or low-image status. Moreover, Levene's test was performed to evaluate the assumption of homogeneity of variances regarding impulse buying behavior (Table 19).

**Table 19.** Levene's Test of Equality of Error Variances

|     |                                          | <i>Levene<br/>Statistic</i> | <i>df1</i> | <i>df2</i> | <i>p</i> |
|-----|------------------------------------------|-----------------------------|------------|------------|----------|
| IBB | Based on Mean                            | .854                        | 5          | 246        | .513     |
|     | Based on Median                          | .600                        | 5          | 246        | .700     |
|     | Based on the Median and with adjusted df | .600                        | 5          | 220.980    | .700     |
|     | Based on trimmed mean                    | .827                        | 5          | 246        | .532     |

*Tests the null hypothesis that the error variance of the dependent variable is equal across groups.<sup>a,b</sup>*

*a. Dependent variable: IBB*

*b. Design: Intercept + visual stimulus group + visual cue + visual stimulus group \* visual cue*

*IBB: Impulse Buying Behavior; df: degrees of freedom; p: significance value.*

The findings show that the assumption was fulfilled since all significance values (Based on Mean:  $p = 0.513$ , based on Median:  $p = 0.700$ , based on Median with adjusted df:  $p = 0.700$ , based on Trimmed Mean:  $p = 0.532$ ) were greater than 0.05. This implies that the error variances of impulse buying behavior were equal across groups, thereby supporting the validity of the ANOVA results. As a result, the variance of the H-IVS and L-IVS groups is similar and homogeneous. Figure 18 shows the profile plot displaying the estimated marginal means of impulse buying behavior for the H-IVS and L-IVS groups across three visual cues.

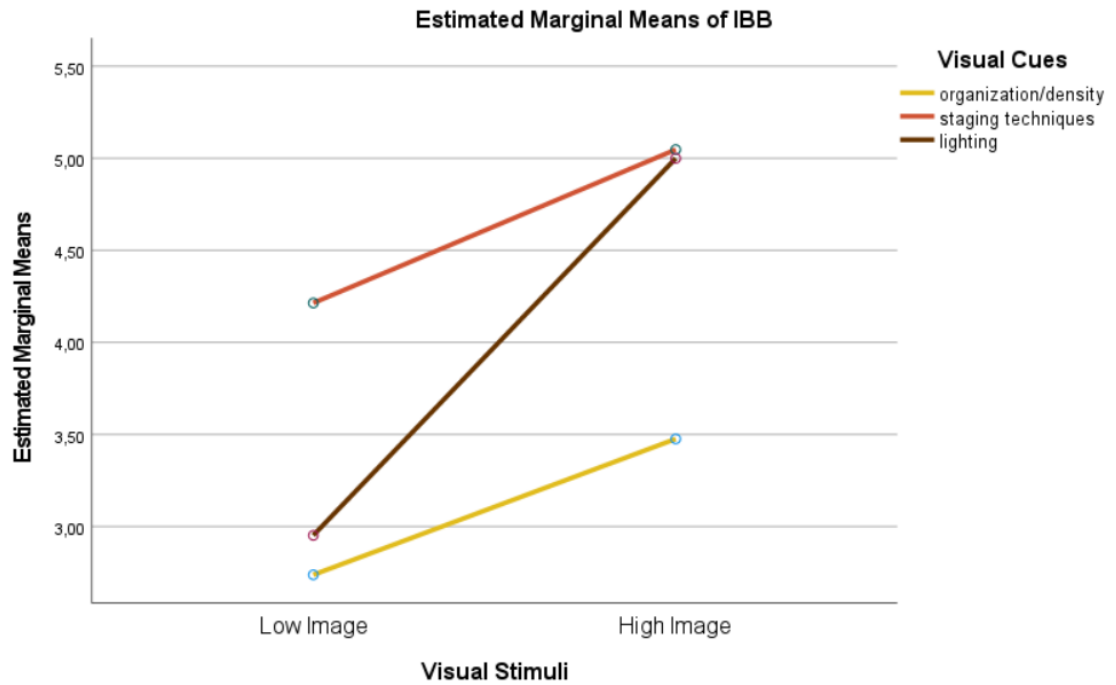


**Figure 18.** Estimated Marginal Means of Impulse Buying Behavior, drawn by the author (2025)

According to the above figure, higher impulse buying behavior is observed in the H-IVS group, with lighting having the most pronounced effect. Impulse buying behavior is higher in the H-IVS group than in the L-IVS group across all three visual cues. Lighting (red line) demonstrates the steepest slope, indicating that the effect of lighting on impulse buying behavior increases the most from low-image to high-image conditions. This shows that lighting significantly influences impulse buying behavior, making it an essential cue in the H-IVS group. Organization/density (blue line) is flatter than others, indicating that its influence on impulse buying behavior is less pronounced than that of staging techniques and lighting. Although the organization/density continues to play a role in impulse buying behavior, its impact is less significant than that of the other two visual cues. The staging technique (green line) demonstrates an apparent increase, though it is not as steep as the lighting. This indicates that the staging technique is also significant, but its impact is slightly less than that of lighting. Overall, participants exposed to high-image visual cues reported significantly higher impulse buying behavior than those exposed to low-image cues.

## 5.5. Mediating Role of Personality Traits on the Visual Cues Affecting the Impulse Buying Behavior

A linear regression analysis examines whether personality traits' cognitive and affective aspects mediate the relationship between high-image visual cues and impulse buying behavior. The linear regression tests whether these personality traits significantly influence impulse buying behavior and act as mediators in the proposed relationship (see Appendix Q). The regression model includes the H-IVS and L-IVS groups as the primary independent variables and impulse buying behavior as the dependent variable. Cognitive and affective aspects are also included as potential mediating variables. Several control variables, such as age, gender, education level, major, shopping frequency, monthly income, and technology familiarity, are also considered (Table 20).

**Table 20.** Examination of the Mediating Role of Cognitive and Affective States

| <i>Variable</i>           | <i>B</i> | <i>β</i> | <i>t</i> | <i>p-value</i> |
|---------------------------|----------|----------|----------|----------------|
| (Constant)                | 0.775    |          | 0.149    | 0.882          |
| Visual Stimulus Group     | 1.236    | 0.520    | 4.493    | <b>0.0001</b>  |
| Age                       | -0.127   | -0.299   | -1.602   | 0.114          |
| Gender                    | 0.264    | 0.072    | 0.684    | 0.496          |
| Education Level           | 0.767    | 0.218    | 1.206    | 0.232          |
| Major                     | 0.123    | 0.133    | 1.012    | 0.315          |
| Shopping Frequency        | -0.022   | -0.018   | -0.146   | 0.884          |
| Monthly Income            | 0.126    | 0.093    | 0.730    | 0.468          |
| Frequency of Computer Use | 0.164    | 0.093    | 0.764    | 0.448          |

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Table 20 Continued

| <i>Variable</i>                 | <i>B</i> | $\beta$ | <i>t</i> | <i>p-value</i> |
|---------------------------------|----------|---------|----------|----------------|
| Duration of Computer Use        | -0.208   | -0.111  | -1.005   | 0.318          |
| Weekly Internet Usage Frequency | 0.010    | 0.002   | 0.015    | 0.988          |
| Duration of Internet Use        | 0.701    | 0.064   | 0.493    | 0.623          |
| Previous VR Use                 | 0.426    | 0.179   | 0.454    | 0.651          |
| Weekly VR Usage Frequency       | -0.010   | -0.004  | -0.011   | 0.991          |
| Frequency of VR Use             | 0.255    | 0.245   | 1.517    | 0.134          |
| Cognitive States                | -0.033   | -0.029  | -0.229   | 0.820          |
| Affective States                | 0.022    | 0.018   | 0.134    | 0.894          |

*a. Dependent Variable: Impulse Buying Behavior*

The visual stimulus group significantly positively affects impulse buying behavior ( $B = 1.236$ ,  $\beta = 0.520$ ,  $t = 4.493$ ,  $p < 0.001$ ). The cognitive aspect does not significantly affect impulse buying behavior ( $B = -0.033$ ,  $\beta = -0.029$ ,  $t = -0.229$ ,  $p = 0.820$ ).

Similarly, the affective aspect does not significantly affect impulse buying behavior ( $B = 0.022$ ,  $\beta = 0.018$ ,  $t = 0.134$ ,  $p = 0.894$ ). Since both cognitive and affective aspects are non-significant predictors of impulse buying behavior, they do not mediate the relationship between high-image visual cues and impulse buying behavior.

The direct effect of H-IVS and high-image visual cues remains significant even after including the mediators, confirming that impulse buying behavior is directly influenced by H-IVS rather than being mediated through personality traits. Even with the addition of mediators, the direct impact of the visual stimulus group remains significant. This confirms that the visual stimulus group directly influences impulse buying behavior rather than being mediated through personality traits.

Age, gender, education level, major, monthly income, and shopping frequency do not significantly affect impulse buying behavior. Similarly, findings on technology familiarity (e.g., VR use and internet usage) have no significant impact on impulse buying behavior. This chapter describes the study's findings. The following chapter will explore how these results are interpreted, considering current literature and theoretical frameworks.



## **CHAPTER VI**

### **DISCUSSION**

The current study examines the relationship between consumers' impulse buying behavior and visual stimuli. This chapter summarizes the study's main findings and places them in the broader perspective of previous research. How the visual stimulus groups, visual cues, impulse buying behavior, and cognitive and affective states are related is discussed here. The findings are examined to determine whether they support or contradict earlier studies based on the implications of visual merchandising techniques. Some research questions and hypotheses were designed to establish how different visual stimuli and cues affect consumers' choices. Table 21 shows the tested hypotheses and their support status. This section details each hypothesis, how results relate to earlier studies, and whether they support the suggested relationships. The discussion is organized into subheadings to go through the survey results comprehensively and how these relate to the hypotheses and previous literature.

**Table 21.** Hypotheses and Results

| <i>Hypothesis</i> | <i>Reason</i>                                                                           | <i>Result</i>                                                                                | <i>Decision</i> |
|-------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------|
| <b>H1</b>         | A significant difference in visual cues between the visual stimulus groups              | High-image visual cues are significantly high                                                | Supported       |
| <b>H1A</b>        | A significant difference in the organization/density between the visual stimulus groups | The organization/density within the high-image visual stimulus groups is significantly high  | Supported       |
| <b>H1B</b>        | A significant difference in the staging techniques between the visual stimulus groups   | The staging techniques within the high-image visual stimulus groups are significantly high   | Supported       |
| <b>H1C</b>        | A significant difference in the lighting between the visual stimulus groups             | The use of lighting in the visual stimulus groups is significantly high                      | Supported       |
| <b>H2</b>         | A significant difference in personality traits between the visual stimulus groups       | No statistically significant difference in personality traits between visual stimulus groups | Rejected        |

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Table 21 Continued

| <i>Hypothesis</i> | <i>Reason</i>                                                                       | <i>Result</i>                                                                                  | <i>Decision</i> |
|-------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------|
| <b>H2A</b>        | A significant difference in the cognitive states between the visual stimulus groups | No statistically significant difference in the cognitive states between visual stimulus groups | Rejected        |
| <b>H2B</b>        | A significant difference in the affective states between the visual stimulus groups | No statistically significant difference in the affective between the visual stimulus groups    | Rejected        |
| <b>H3</b>         | Effect of the visual stimulus groups and visual cues on IBB                         | Significant effect of visual stimulus groups and visual cues on IBB                            | Supported       |
| <b>H4</b>         | Effect of visual cues on IBB through its influence on personality traits            | No influence of visual cues on personality traits                                              | Rejected        |

*IBB: Impulse Buying Behavior*

### 6.1. The Effect of Visual Stimulus Groups on Impulse Buying Behavior and Personality Traits

The results of this study strongly support H1: There is a significant difference in visual cues between high and low-image visual stimuli in virtual environments. According to the findings, there is a significant difference in the IBB between the H-IVS and L-IVS groups ( $M=4.51$ ,  $SD=1.05$  vs.  $M=3.30$ ,  $SD=1.02$ ,  $t(82) = -5.34$ ,  $p < 0.01$ ). The H-IVS

group reported significantly higher scores on the overall VMDCS, as well as on its visual cues, which supports the following hypotheses:

H1A: There is a significant difference in the organization/density between high and low-image visual stimuli in virtual environments.

H1B: There is a significant difference in the staging techniques between high and low-image visual stimuli in virtual environments.

H1C: There is a significant difference in the lighting between the high and low-image visual stimuli in virtual environments.

The results showed that, compared with low-image displays, all dimensions, including organization/density, staging techniques, and lighting of high-image visual cues, were rated more favorably. These findings agree with the results of Kerfoot et al. (2003), who showed that high-image displays that are organized neatly and aesthetically pleasing positively affect consumers. According to the result, there is a statistical difference between the H-IVS and L-IVS groups regarding impulse buying behavior. The results support Mattila and Wirtz's 2001 findings, where it was determined that visual cues affect impulse buying. Further, the findings support the previous literature, such as Gudonavičienė & Alijosiene (2015), where it was suggested that attractive visual merchandising may stimulate consumer response in retail.

Among the visual cues, lighting was the most influential cue ( $r = 0.832$ ,  $p = 0.0001$ ). It significantly correlated with the impulse buying behavior in both H-IVS and L-IVS groups. Furthermore, lighting had the most substantial relationship with being in the H-IVS. These findings confirm earlier research into the importance of lighting in retail settings, such as Joy et al. (2014), Quartier et al. (2014), and Summers and Hebert (2001). In promoting pleasant consumer experiences, lighting would alter the store environment to make the products more visible and appealing. Researchers such as Areni and Kim (1994), Dion and Arnould (2011), Logkizidou et al. (2019), and Reynolds-McIlnay et al. (2017) support this view. Previous literature has identified lighting as a critical variable affecting consumer perception and enhancing buying intentions (Reynolds-McIlnay et al., 2017; Joy et al., 2014).

The lighting was more strongly related to the H-IVS group than the organization/density and the staging techniques. Still, these visual cues for the H-IVS group received significantly higher rankings than those for the L-IVS group. Figure 19 demonstrates the correlation matrix showing the relationships between the variables in the H-IVS. These findings are consistent with the previous literature, such as that of Kerfoot et al. (2003) and Sevilla and Townsend (2016), who noted that fewer products displayed in a more extensive and neat display show that the store and brand image is valuable. This finding is also compatible with the suggestions that museological staging techniques endow the exposed objects with luxury (Logkizidou et al., 2019), displays explaining the manufacturing process of merchandise raise the quality of brands (Dion & Arnould, 2011; Hollenbeck et al., 2008), and technology and specialized display elements stage a product more easily (Vukadin et al., 2016). The findings indicate that retailers must focus on high-image visual cues that effectively use lighting, organization, and staging techniques to enhance consumer impulse buying behavior.

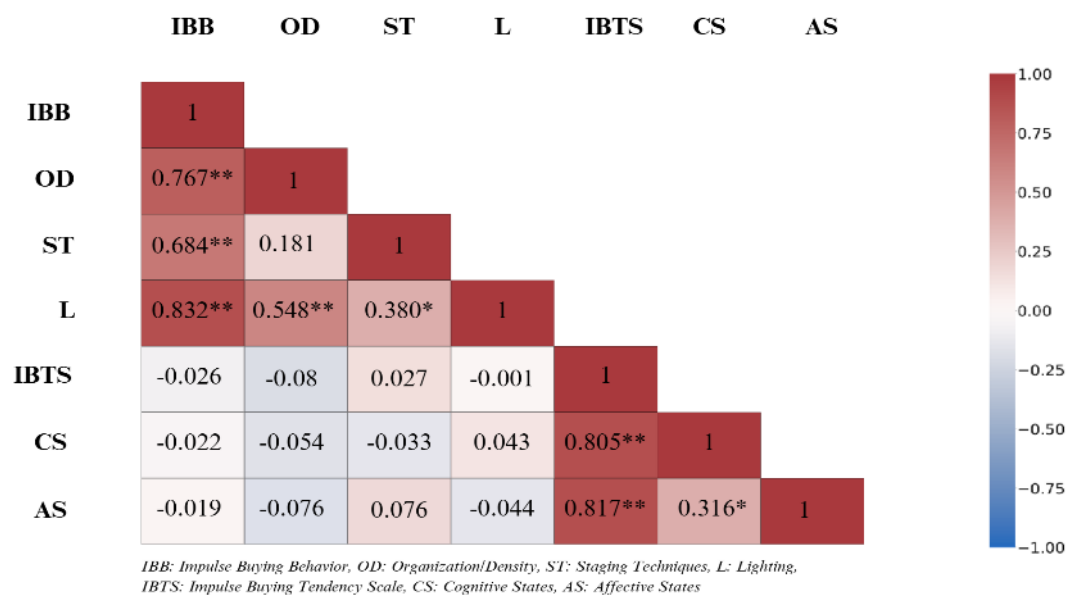


**Figure 19.** Correlation matrix showing the relationships between the variables in the high-image visual stimulus group, drawn by the author (2025)

In contrast to the findings regarding VMDCS, the results do not support the following hypotheses:

H2: There is a significant difference in personality traits between high and low-image visual stimuli in virtual environments.

H2A: There is a significant difference in the cognitive states between high and low-image visual stimuli in virtual environments.

H2B: There is a significant difference in the affective states between high and low-image visual stimuli in virtual environments.

There is no statistically significant difference in personality traits and cognitive and affective states between the H-IVS and L-IVS groups. Although the personality traits and sub-scales were more significant in the H-IVS groups, these differences were insignificant ( $p > 0.05$ ). This finding suggests that although visual stimuli can encourage impulse buying, they do not necessarily lead to a more significant long-term tendency toward impulse buying. This contrasts with earlier studies that suggested a direct link between tendencies toward impulse buying and the effectiveness of visual merchandising (Mohan et al., 2013). The results confirm that visual stimuli considerably affect personality traits. Still, they also emphasize the complexity of IBTs and their possible independence from impulse buying behavior.

## **6.2. Examination of the Effects of Visual Stimulus Groups and Visual Cues on Impulse Buying Behavior**

The two-way ANOVA results confirmed that visual stimulus groups and visual cues significantly influence impulse buying behavior, thereby supporting H3: The visual stimuli and visual cues dictate impulse buying behavior in virtual environments. In particular, the relationship between the visual stimulus groups and visual cues ( $F(2, 246) = 5.221, p = 0.006$ ) indicates that the effectiveness of visual merchandising strategies differs based on whether the display is categorized as H-IVS or L-IVS. This suggests that the existence of H-IVS and the high-image visual cues play a role in increasing impulse buying behavior.

Moreover, this result supports earlier research findings demonstrating a strong connection between H-IVS and high-impulse buying behavior (Jaini et al., 2021; Zolkifly & Baharom, 2016). This finding is consistent with the existing literature highlighting the importance of visual merchandising in shaping consumer behavior (Gudonaviciene & Alijosiene, 2015; Sundstrom et al., 2019). The H-IVS group

demonstrated higher impulse buying behavior and a more positive assessment of the visual cues, aligning with research by Peck and Childers (2006), who indicated that high sensory stimuli directly promote impulse buying. The significant effect of visual cues further emphasizes the crucial role of some aspects in stimulating impulse buys. The finding that organization/density, staging techniques, and lighting all play a role in impulse buying behavior indicates that retailers should consider these factors when designing their store environments.

### **6.3. Mediating Role of Cognitive and Affective Aspects in Impulse Buying Behavior**

The results of this study do not support H4: The visual stimuli affect impulse buying behavior through their influence on personality traits in virtual environments. The linear regression analysis revealed that the cognitive and affective aspects do not mediate the relationship between high-image visual cues and impulse buying behavior. The absence of considerable mediation suggests that although cognitive and affective aspects play a role in understanding consumer behavior, they might not directly affect the immediate influence of visual cues on impulse buying behavior. These findings are consistent with some studies indicating that cognitive and affective responses may not always mediate behavioral outcomes, particularly in contexts where immediate sensory stimuli, like visual merchandising, exert a more dominant influence (Rook, 1987; Verplanken & Herabadi, 2001). Even when cognitive and affective mediators are considered, the direct effect of high-image visual cues on impulse buying behavior remains significant. It indicates that the visual stimuli alone have sufficient power to provoke impulse buying behavior without requiring cognitive or affective processing. Figure 20 shows the conceptual model according to the results.

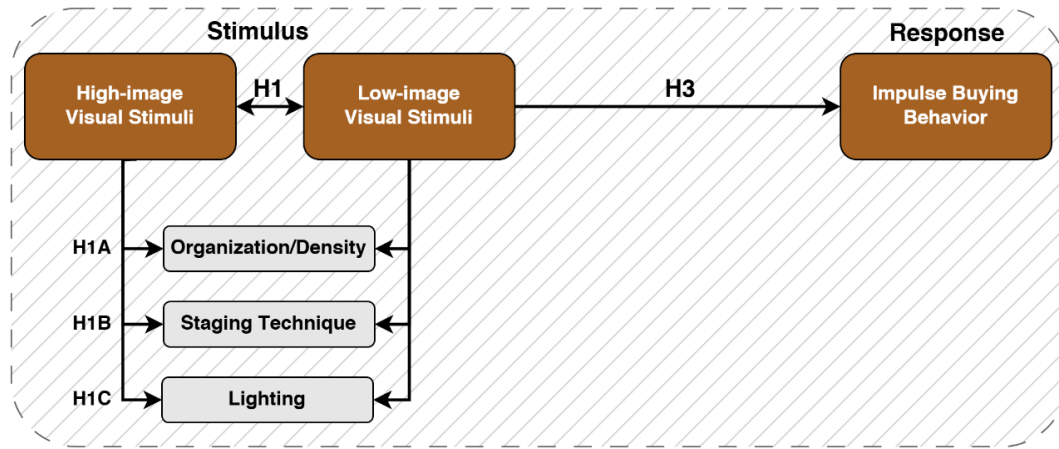


**Figure 20.** Final conceptual framework, drawn by the author (2025)

## 6.4. Sociodemographic Insights and Technology Familiarity

The socio-demographic data gathered for this study offer a deeper understanding of how consumer responses to visual stimuli and impulse buying behavior were influenced. Regarding age, young participants, mainly younger in the sample of 18–24-year-olds, tend to be more sensitive to all the visual cues, which also corresponds to earlier research that linked younger consumers to impulsive and hedonic shopping tendencies (Dhaundiyal & Coughlan, 2016; Djafarova & Bowes, 2021; Zuo, 2024). Such behavior is likely more responsive to the environment and, thus, open to experiential shopping. Moreover, although the primary focus of this study was not the gender difference, the results are in line with the previous research (Atulkar & Kesari, 2018; Silvera et al., 2008), as the female participants have higher levels of impulse buying behavior and positive opinions of H-IVS.

From the experimental design perspective, the study used a VE for testing and thus isolated and analyzed the effect of visual cues. The results also show that participants' assessments were not much influenced by their previous experience with VR technology. Using VR technology is an effective way to stimulate in-store experiences, which is also in line with the view of Bonetti et al. (2018), who support the application of immersive technologies to retail design studies. This chapter has highlighted the significance of high-image visual cues in influencing consumer impulse buying behavior. The following conclusion examines the research questions, connecting the findings to established literature and highlighting the necessity for additional investigation into the contextual factors that affect visual merchandising effectiveness.

## **CHAPTER VII**

### **CONCLUSION**

The current study focused on the impact of visual stimuli on consumers' impulse buying behavior. It examined whether visual cues, such as organization/density, staging techniques, and lighting, influence impulse buying and whether individual consumer traits moderate these effects. The results proved that H-IVS and high-image visual cues significantly affect impulsive buying behavior. The hypotheses for the visual stimuli and visual cues, such as organization/density, staging techniques, and lighting effects, were supported.

However, although the high-image visual cues impacted impulse buying behavior, they did not significantly affect the IBT. This finding rejected the belief that high-image cues automatically enhance consumers' tendency to make impulse buys. The tendency to make impulse buying seems to be a stable personality trait rather than a state influenced by short-term visual exposure. This supports the idea that personality traits play a more significant role in predicting impulse buying behavior than previously thought (Verplanken & Herabadi, 2001; Vohs & Faber, 2007).

Furthermore, the research found strong evidence of the influence of visual stimulus group and visual cues on impulse buying behavior. These results that H-IVS and their cues are significant contributors to impulse buying. The mediation analysis did not support the hypothesis that cognitive and affective states mediate the relationship between visual cues and impulse buying behavior. This indicates that visual stimuli have a more direct effect rather than being mediated by cognitive and affective aspects.

This study's research questions focused on how visual stimuli interact with consumer impulse buying behavior. The results confirm that visual stimuli remain an essential element of retail strategy. Although previous studies have shown a strong relationship between visual merchandising, visual stimuli, and consumer behavior (Baker et al., 1994; Kerfoot et al., 2003; Logkizidou et al., 2016), this study emphasizes the significance of identifying contextual factors, which can modify or strengthen the impact of H-IVS and high-image visual cues. These results have some implications for designers and retailers.

## **7.1. Implications for Designers**

The results of this study offer essential insights into implications for designers, especially those in visual merchandising and retail settings. Understanding the connection between visual stimuli and consumer behavior can significantly improve the efficacy of design strategies. Below, several key implications for designers are outlined.

### *1. Prioritization of High-Image Visual Stimuli*

Designers need to focus on developing H-IVS and high-image visual cues. The study results show that high-image cues significantly increase impulse buying behavior. It indicates that designers should concentrate on creating visually attractive and aesthetically captivating displays to draw consumers' attention and stimulate impulse buys. First, designers need to prioritize the strategic use of lighting. Lighting is a significant element influencing impulse buying behavior. Using incandescent spotlights, designers can design high-image displays utilizing accent lighting that focuses light on the product with a warm white color.

Next, the organization and density of products in VMDs impacted consumer behavior significantly. Designers can highlight the neat organization of the products to demonstrate that the store and brand image are valuable. According to the space-to-product ratio, product placement in VMDs can be placed neatly in a more prominent display unit. Finally, museological staging techniques give the product on display a sense of luxury by referencing the art world, which is influential in increasing impulse

buying behavior. Museological staging techniques can be achieved with a pedestal block holding the product covered with a glass case. Storytelling is also a successful staging technique to increase perceptions of the originality and quality of brands. Designers can use a background screen that describes the product's manufacturing process to teach consumers while displaying the products.

## *2. Continuous Assessment and Adaptation*

The retail market continually evolves, perceiving consumers' preferences and technological advancements. Designers have focused on revising and reworking visual merchandising concepts to stay updated and competitive. Consumer feedback must be collected to comprehend the shifting dynamics of impulse buying, analyze buying trends, and conduct sequential research. The designers would improve their visual merchandising strategies and thereby their impact on impulse buying behavior by being responsive to consumer demand. These implications would eventually be used to guide designers interested in improving the shopping experience and using opportunities arising from impulse buying. Apart from implications for designers, the present study has some limitations.

## **7.2. Limitations of the Study**

This study has its limitations despite its contributions. First, given that this study is on a specific retail setting, its findings will tend to be less generalizable to other circumstances. The influence of visual stimuli on impulse buying may vary depending on the retail setting type, e.g., virtual or real environments. The study was conducted in a VR setting. Still, while it does allow for controlled experimental conditions, it does not carry over into entirely recreating the complex nature of real-life retail settings. The findings may not be as generalizable, especially if consumers behave differently while interacting with visual stimuli in a VR environment than when they would in their usual shopping environment.

Next, participants viewed each high-image visual cue separately and independently of a general context. While this approach does have the advantage of clearly focusing attention on influences, it lacks the richness and dynamic nature of in-store displays, in which numerous merchandising elements often work together to influence consumer behavior. Moreover, because only female participants attended the study sample, it is hard to generalize the findings to a broader consumer population. Therefore, future studies should involve a broader range of participant demographics according to gender differences in buying behavior, especially with IBTs and responses to visual stimuli. Finally, the research only tested one product, a black leather handbag, which might not represent other product categories. H-IVS can produce varied reactions to different types of products, especially those with varying emotional or functional appeal levels. Another study with a mix of different products would provide more comprehensive images of the impact of visual stimuli and impulse buying behavior. The following part provides suggestions for further studies based on these limitations.

### **7.3. Suggestions for Further Studies**

Several directions for further research are suggested to build on the conclusions and constraints of this study. To understand how digital merchandising strategies influence impulse buying behavior, researchers should start by investigating the influence of visual stimuli in different retail settings, including electronic ones. This argument becomes increasingly urgent with the growing popularity of e-commerce and the challenge it presents to visual stimuli. Longitudinal studies can also explain consumer behavior changes due to evolving visual merchandising strategies. This approach would allow researchers to capture consumer preferences and behavior shifts as store environments change. Qualitative research techniques, such as focus groups or interviews, could also investigate the affective underpinnings of impulse buying and consumer motivation. These results would complement quantitative data. Follow-up research would also have to assess the effect of visual stimuli in an actual store environment to complement results from the VR environment. Although VR offers a controlled environment where specific factors can be tested, physical stores have more social interactions and sensorial inputs that can influence impulse buying. Exploring how consumers respond to H-IVS in retail environments may provide greater

ecological validity for these findings. Further studies should consider visual stimuli and other sensory factors, like store crowding or auditory elements, as they may significantly affect consumer behavior.

Next, future studies should explore the interactions of visual cues when they are displayed together, not in isolation. Many factors, such as organization/density, staging techniques, and lighting, co-exist within a dynamic retail environment and could be perceived differently by consumers. Investigating the combined effects of many visual marketing strategies will help us better understand how those cues affect impulse buying behavior. Moreover, since this study is interdisciplinary and includes many fields such as marketing research, interior architecture, and virtual design, different visual cues from these fields can be combined in further studies.

Lastly, expanding participant demographics to include male consumers and consumers from different backgrounds would make determining whether gender and cultural differences influence impulse buying habits easier. Visual stimuli could have a different effect on men and women. Cultural factors could also influence consumer behavior. Future studies should use more diverse samples to enhance the generalizability of the results further. Moreover, the future research will investigate product categories other than black leather handbags. Since different types of products appeal differently, impulse buying responses differ based on the type of product on display. Investigating H-IVS effects with different types of products might provide further insight into consumer responses. Filling in these research gaps will help advance future studies' knowledge on the impact of visual merchandising techniques on consumers' decision-making and provide valuable information to retailers and designers who want to enhance their merchandising techniques.

## REFERENCES

- Ahmad, M. B., Ali, H. F., Malik, M. S., Humayun, A. A., & Ahmad, S. (2019). Factors affecting impulsive buying behavior with mediating role of positive mood: An empirical study. *European Online Journal of Natural and Social Sciences*, 8(1), 17–35.
- Aleke, B., Ojiako, U., & Wainwright, D. W. (2011). ICT adoption in developing countries: Perspectives from small-scale agribusinesses. *Journal of Enterprise Information Management*, 24(1), 68–84.
- Amos, C., Holmes, G., & Keneson, W. C. (2014). A meta-analysis of consumer impulse buying. *Journal of Retailing and Consumer Services*, 21, 86–97. <https://doi.org/10.1016/j.jretconser.2013.11.004>
- Anderson, L. (2025). *Innovative Visual Merchandising Strategies in the Digital Era*.
- Areni, C. S., & Kim, D. (1994). The influence of in-store lighting on consumers' examination of merchandise in a wine store. *International Journal of Research in Marketing*, 11(2), 117–125. [https://doi.org/10.1016/0167-8116\(94\)90023-X](https://doi.org/10.1016/0167-8116(94)90023-X)
- Argo, J. J., & Dahl, D. W. (2018). Standards of beauty: The impact of mannequins in the retail context. *Journal of Consumer Research*, 44(5), 974–990. <https://doi.org/10.1093/jcr/ucx072>
- Astrid, N. R., & Mustika, S. P. (2013). Effect on visual merchandising in fashion stores on female consumers' purchase intention. *Proceedings of World Business and Social Science Research Conference*, 24-25 October 2013, Bangkok, Thailand.
- Atulkar, S., & Kesari, B. (2018). Role of consumer traits and situational factors on impulse buying: Does gender matter? *International Journal of Retail and*

*Distribution Management*, 46(4), 386–405. <https://doi.org/10.1108/IJRDM-12-2016-0237>

Badgaiyan, A. J., & Verma, A. (2015). Does urge to buy impulsively differ from impulsive buying behaviour? Assessing the impact of situational factors. *Journal of Retailing and Consumer Services*, 22, 145–157. <https://doi.org/10.1016/j.jretconser.2014.10.002>

Badgaiyan, A. J., Verma, A., & Dixit, S. (2016). Impulsive buying tendency: Measuring important relationships with a new perspective and an indigenous scale. *IIMB Management Review*, 28, 186–199. <https://doi.org/10.1016/j.iimb.2016.06.009>

Bagozzi, R. P. (1986). *Principles of marketing management*. Science Research Associates.

Bailey, S., & Baker, J. (2014). *Visual merchandising for fashion*. Bloomsbury Publishing Plc.

Baker, J., Grewal, D., & Parasuraman, A. (1994). The influence of store environment on quality inferences and store image. *Journal of the Academy of Marketing Science*, 22(4), 328–339. <https://doi.org/10.1177/0092070394224002>

Baker, J., Levy, M., & Grewal, D. (1992). An experimental approach to making retail store environmental decisions. *Journal of Retailing*, 68(4), 445–460.

Baker, J. A., Parasuraman, D. G., & Voss, G. B. (2002). The influence of multiple store environment cues on perceived merchandise value and patronage intentions. *Journal of Marketing*, 66(2), 120–141.

Bandyopadhyay, N. (2016). The role of self-esteem, negative affect, and normative influence in impulse buying. *Marketing Intelligence & Planning*, 34(4), 523–539. <https://doi.org/10.1108/MIP-09-2015-0180>

Bandyopadhyay, N., Sivakumaran, B., Patro, S., & Kumar, R. S. (2021). Immediate or delayed! Whether various types of consumer sales promotions drive impulse buying?: An empirical investigation. *Journal of Retail and Consumer Services*,

61, 102532. <https://doi.org/10.1016/j.jretconser.2021.102532>

Basu, R., Paul, J., & Singh, K. (2022). Visual merchandising and store atmospherics: An integrated review and future research directions. *Journal of Business Research*, 151, 397–408. <https://doi.org/10.1016/j.jbusres.2022.07.019>

Baumeister, R. F. (2002). Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research*, 28(4), 670–676.

Bayley, G., & Nancarrow, C. (1998). Impulse purchasing: A qualitative exploration of the phenomenon. *Qualitative Market Research: An International Journal*, 1(2), 99–114.

Beatty, S. E., & Ferrell, M. E. (1998). Impulse buying: Modeling its precursors. *Journal of Retailing*, 74(2), 169–191. [https://doi.org/10.1016/S0022-4359\(99\)80092-X](https://doi.org/10.1016/S0022-4359(99)80092-X)

Bell, J., & Ternus, K. (2006). *Silent selling: Best practices and effective strategies in visual merchandising*. Fairchild Publications.

Bell, J., & Ternus, K. (2012). *Silent selling: Best practices and effective strategies in visual merchandising* (4th ed.). Fairchild Books.

Bellizzi, J. A., Crowley, A. E., & Hasty, R. W. (1983). The effects of color in store design. *Journal of Retailing*, 59(1), 21–45.  
<https://psycnet.apa.org/record/1984-10983-001>

Benjamin, W. (1999). *The arcades project*. Harvard University Press.

Bhalla, S., & Anuraag, S. (2010). *Visual merchandising*. Tata McGraw-Hill Education.

Bhatti, K. L., & Seemab, L. (2013). The impact of visual merchandising on consumer impulse buying behaviour. *Proceedings of the 4th Asia-Pacific Business Research Conference*, 30 September–1 October 2013, Singapore.

Bide, B. (2018). More than window dressing: Visual merchandising and austerity in London's West End, 1945–50. *Business History*, 60(7), 983–1003.

- Bitner, M. J. (1990). Evaluating service encounters: The effects of physical surroundings and employee responses. *Journal of Marketing*, 54(4), 69–82.
- Bitner, M. J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing*, 56(2), 57–71.
- Bonetti, F., Warnaby, G., & Quinn, L. (2018). Augmented reality and virtual reality in physical and online retailing: A review, synthesis, and research agenda. *International Journal of Management Reviews*, 20(3), 360–385.  
<https://doi.org/10.1111/ijmr.12114>
- Borghini, S., Diamond, N., Kozinets, R. V., McGrath, M. A., Muniz, A. M., Jr., & Sherry, J. F., Jr. (2009). Why are themed brand stores so powerful? Retail brand ideology at American Girl Place. *Journal of Retailing*, 85(3), 363–375.  
<https://doi.org/10.1016/j.jretai.2009.05.003>
- Cakanlar, A., & Nguyen, T. (2019). The influence of culture on impulse buying. *Journal of Consumer Marketing*, 36(1), 12–23.
- Cant, M. C., & Hefer, M. Y. (2012). Visual merchandising displays: Wasted effort or strategic move? The dilemma faced by apparel retail stores. *Journal of Applied Business Research (JABR)*, 28(6), 1489–1496.
- Cant, M. C., & Hefer, Y. (2014). Visual merchandising displays effect-or not-on consumers: The predicament faced by apparel retailers. *Journal of Business and Retail Management Research*, 8(2).
- Cant, M. C., van Heerden, C. H., & Ngambi, H. C. (2013). *Marketing management: A South African perspective* (2nd ed.). Juta.
- Chan, J. K. Y., & Chan, P. Y. L. (2008). Merchandise display affects store image. *European Advances in Consumer Research*, 8, 408–414.
- Chan, T. K. H., Cheung, C. M. K., & Lee, Z. W. Y. (2017). The state of online impulse-buying research: A literature analysis. *Information & Management*, 54(2), 204–217.
- Chen, S., Min, Q., & Xu, X. (2021). Investigating the role of social identification on

- impulse buying in mobile social commerce: A cross-cultural comparison. *Industrial Management & Data Systems*, 121(12), 2571–2594.
- Chen, Y. F., & Wang, R. Y. (2016). Are humans rational? Exploring factors influencing impulse buying intention and continuous impulse buying intention. *Journal of Consumer Behaviour*, 15(2), 186–197.
- Cheng, Y. H., Chuang, S. C., Wang, S. M., & Kuo, S. Y. (2013). The effect of comparison's gender on impulsive purchasing: The moderating factor of cohesiveness and susceptibility to interpersonal influence. *Journal of Applied Social Psychology*, 43(1), 227–236.
- Chih, W. H., Wu, C. H. J., & Li, H. J. (2012). The antecedents of consumer online buying impulsiveness on a travel website: Individual internal factor perspectives. *Journal of Travel and Tourism Marketing*, 29(5), 430–443.
- Choi, J. (2016). *Consumer impulse buying of food at festivals and events: Understanding the role of sensory cues* (Master's thesis). Kansas State University, Manhattan, Kan.
- Chow, A. (2020). *Retail therapy or an urge to splurge: A study of impulse buying among university students* (Order No. 28372160). ProQuest Dissertations & Theses Global. <https://www.proquest.com/dissertations-theses/retail-therapy-urge-splurge-study-impulse-buying/docview/2506645268/se-2>
- Chuang, C. L., Tian, H. L., & Lin, R. H. (2015). Applicability of prospect theory on impulse buying intention and relationship between impulse buying tendency and impulse buying intention. *Marketing Review*, 12(1), 99–127.
- Churchill, G. A., & Peter, J. P. (1998). *Marketing: Creating value for customers*. McGraw-Hill Irwin.
- Cobb, J. C., & Hoyer, W. D. (1986). Planned versus impulse purchase behaviour. *Journal of Retailing*, 62(4), 384–409.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

- Coolican, H. (1998). *Research methods. Psychology: An integrated approach*. Addison-Wesley Longman.
- Crowley, A. E. (1993). The two-dimensional impact of color on shopping. *Marketing Letters*, 4(1), 59–69.
- Davies, B., & Ward, P. (2002). *Managing retail consumption*. Wiley.
- Davies, B. J., & Ward, P. (2005). Exploring the connections between visual merchandising and retail branding: An application of facet theory. *International Journal of Retail and Distribution Management*, 33(7), 505–513.
- Dawson, S., & Kim, M. (2010). Cues on apparel websites that trigger impulse purchases. *Journal of Fashion Marketing and Management*, 14(2), 230–246.
- De Ridder, D., & Gillebaart, M. (2017). Lessons learned from trait self-control in well-being: Making the case for routines and initiation as important components of trait self-control. *Health Psychology Review*, 11(1), 89–99.
- Dey, D. K., & Srivastava, A. (2017). Impulse buying intentions of young consumers from a hedonic shopping perspective. *Journal of Indian Business Research*, 9(4), 266–282. <https://doi.org/10.1108/jibr-02-2017-0018>
- Dhaundiyal, M., & Coughlan, J. (2016). Investigating the effects of shyness and sociability on customer impulse buying tendencies. *International Journal of Retail & Distribution Management*, 44(9), 923–939.
- Dholakia, U. M. (2000). Temptation and resistance: An integrated model of consumption impulse formation and enactment. *Psychology & Marketing*, 17(11), 955–982.
- Diamond, J., & Diamond, E. (2007). *Contemporary visual merchandising environmental design* (4th ed.). Prentice Hall.
- Dion, D., & Arnould, E. (2011). Retail luxury strategy: Assembling charisma through art and magic. *Journal of Retailing*, 87(4), 502–520. <https://doi.org/10.1016/j.jretai.2011.09.001>

- Dittmar, H., Beattie, J., & Friese, S. (1995). Gender identity and material symbols: Objects and decision considerations in impulse purchases. *Journal of Economic Psychology*, 16(3), 491–511.
- Dittmar, H., Beattie, J., & Friese, S. (1996). Objects, decision considerations, and self-image in men's and women's impulse purchases. *Acta Psychologica*, 93, 187–206.
- Dittmar, H., & Drury, J. (2000). Self-image – is it in the bag? A qualitative comparison between “ordinary” and “excessive” consumers. *Journal of Economic Psychology*, 21, 109–142.
- Djafarova, E., & Bowes, T. (2021). ‘Instagram made me buy it’: Generation Z impulse purchases in the fashion industry. *Journal of Retailing and Consumer Services*, 59, 102345.
- Domina, T., Lee, S. E., & MacGillivray, M. (2012). Understanding factors affecting consumer intention to shop in a virtual world. *Journal of Retailing and Consumer Services*, 19(6), 613–620.
- Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing*, 58(1), 34–57.
- Donovan, R. J., Rossiter, J. R., Marcoolyn, G., & Nesdale, A. (1994). Store atmosphere and purchasing behavior. *Journal of Retailing*, 70, 283–294.
- DuPont de Nemours and Co. (1945, 1949, 1959, 1965). *Consumer buying habits studies*.
- Durmaz, Y. (2014). The impact of psychological factors on consumer buying behavior and an empirical application in Turkey. *Asian Social Science*, 10(6).  
<https://doi.org/10.5539/ass.v10n6p194>
- Ebster, C., & Garaus, M. (2011). *Store design and visual merchandising: Creating store space that encourages buying*. Business Expert Press.
- Edwards, S., & Shackley, M. (1992). Measuring the effectiveness of retail window display as an element of the marketing mix. *International Journal of*

*Advertising*, 11(3), 193–202.

Engel, J., & Blackwell, R. (1982). *Consumer behaviour*. Dryden Press.

Fahreza, M., Rahayu, A., & Hendrayati, H. (2024). Analysis of the role of store atmosphere in influencing consumer purchasing decisions at XYZ Cooperative. *International Journal of Business, Economics, and Social Development*, 5(1), 111–119. <https://doi.org/10.46336/ijbesd.v5i1.583>

Fenton-O’Creevy, M., Dibb, S., & Furnham, A. (2018). Antecedents and consequences of chronic impulsive buying: Can impulsive buying be understood as dysfunctional self-regulation? *Psychology & Marketing*, 35, 175–188.

Fiore, A. M., Yah, X., & Yoh, E. (2000). Effects of the product display and environmental fragrancing on approach responses and pleasurable experiences. *Psychology & Marketing*, 17(1), 27–42.

Garaus, M., & Wagner, U. (2019). Let me entertain you—Increasing overall store satisfaction through digital signage in retail waiting areas. *Journal of Retailing and Consumer Services*, 47, 331–338.

Gardner, M. P., & Siomkos, G. (1985). Toward a methodology for assessing effects of in-store atmosphere. *Advances in Consumer Research*, 27–31.

Gardner, M. P., & Siomkos, G. J. (1986). Toward a methodology for assessing the effects of in-store atmospherics. *Advances in Consumer Research*, 13, 27–31.

Gehrt, K. C., & Yan, R. N. (2004). Situational, consumer, and retailer factors affecting internet, catalog, and store shopping. *International Journal of Retail and Distribution Management*, 32(1), 5–18.

George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference* (17.0 update, 10a ed.). Pearson.

Grewal, D., & Baker, J. (1994). Do retail store environmental factors affect consumers’ price acceptability? An empirical examination. *International Journal of Research in Marketing*, 11(2), 107–115. [https://doi.org/10.1016/0167-8116\(94\)90022-1](https://doi.org/10.1016/0167-8116(94)90022-1)

- Gudonaviciene, R., & Alijosiene, S. (2015). Visual merchandising impact on impulse buying behaviour. *Social and Behavioral Sciences*, 213, 635–640.
- Gultekin, B., & Ozer, L. (2012). The influence of hedonic motives and browsing on impulse buying. *Journal of Economics and Behavioral Studies*, 4(3), 180–189.
- Ha, Y., & Lennon, S. J. (2010). Online visual merchandising (VMD) cues and consumer pleasure and arousal: Purchasing versus browsing situation. *Psychology & Marketing*, 27(2), 141–165.
- Ha, Y., Kwon, W. S., & Lennon, S. J. (2007). Online visual merchandising (VMD) of apparel web sites. *Journal of Fashion Marketing and Management: An International Journal*, 11(4), 477–493.
- Hagtvedt, H., & Patrick, V. M. (2008). Art infusion: The influence of visual art on the perception and evaluation of consumer products. *Journal of Marketing Research*, 45(3), 379–389. <https://doi.org/10.1509/jmkr.45.3.379>
- Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson Educational International.
- Hansen, J., & Wänke, M. (2011). The abstractness of luxury. *Journal of Economic Psychology*, 32(5), 789–796. <https://doi.org/10.1016/j.joep.2011.05.005>
- Harmancioglu, N., Finney, R. Z., & Joseph, M. (2009). Impulse purchases of new products: An empirical analysis. *Journal of Product and Brand Management*, 18(1), 27–37.
- Hartman, J. J. (1995). The psychoanalytic study of society. XVI, 1991: Alfred Irving Hallowell: An appreciation. *Psychoanalytic Quarterly*, 64, 205–205.
- Hashmi, H. B. A., Shu, C., & Haider, S. W. (2020). Moderating effect of hedonism on store environment-impulse buying nexus. *International Journal of Retail and Distribution Management*, 48(5), 465–483.
- Hausman, A. (2000). A multi-method investigation of consumer motivations in impulse buying behaviour. *Journal of Consumer Marketing*, 5(7), 403–426.

- Herabadi, A. G., Verplanken, B., & van Knippenberg, A. (2009). Consumption experience of impulse buying in Indonesia: Emotional arousal and hedonistic considerations. *Asian Journal of Social Psychology*, 12, 20–31.
- Hollenbeck, C. R., Peters, C., & Zinkhan, G. M. (2008). Retail spectacles and brand meaning: Insights from a brand museum case study. *Journal of Retailing*, 84(3), 334–353. <https://doi.org/10.1016/j.jretai.2008.05.003>
- Huber, J., & McCann, J. (1982). The impact of inferential beliefs on product evaluations. *Journal of Marketing Research*, 19(3), 324–333. <https://doi.org/10.1177/002224378201900305>
- Hubert, M., Hubert, M., Florack, A., Linzmajer, M., & Kenning, P. (2013). Neural correlates of impulsive buying tendencies during perception of product packaging. *Psychology & Marketing*, 30(10), 861–873.
- Huettl, V., & Gierl, H. (2012). Visual art in advertising: The effects of utilitarian vs. hedonic product positioning and price information. *Marketing Letters*, 23(3), 893–904.
- Hung, K., Chen, A. H., Peng, N., Hackley, C., Tiwsakul, R. A., & Chou, C. (2011). Antecedents of luxury brand purchase intention. *Journal of Product and Brand Management*, 20, 457–467.
- Iyer, E. S. (1989). Unplanned purchasing: Knowledge of shopping environment and time pressure. *Journal of Retailing*, 65, 40–57.
- Jaini, A., Wan Zulkiffli, W. F., Ismail, M., Mohd, F., & Hussin, H. (2021). Understanding the influence of visual merchandising on consumers' impulse buying behaviour: Analysing the literature. *International Journal of Academic Research in Business and Social Sciences*, 11(12). <https://doi.org/10.6007/ijarbss/v11-i12/11277>
- Jang, J. Y., Baek, E., & Choo, H. J. (2018). Managing the visual environment of a fashion store. *International Journal of Retail & Distribution Management*, 46(2), 210–226.

- Jeffrey, S. A., & Hodge, R. (2007). Factors influencing impulse buying during an online purchase. *Electronic Commerce Research*, 7(3), 367–379.
- Jones, M. R., Weun, S., & Beatty, S. (2003). The product specific nature of impulse buying tendency. *Journal of Business Research*, 56(7), 505–511.
- Joy, A., Wang, J. J., Chan, T. S., Sherry, J. F., Jr., & Cui, G. (2014). M (Art) worlds: Consumer perceptions of how luxury brand stores become art institutions. *Journal of Retailing*, 90(3), 347–364.  
<https://doi.org/10.1016/j.jretai.2014.01.002>
- Juárez-Varón, D., Mengual-Recuerda, A., Capatina, A., & Cansado, M. N. (2023). Footwear consumer behavior: The influence of stimuli on emotions and decision making. *Journal of Business Research*, 164, 114016.
- Kacen, J. J., Hess, J., & Walker, D. (2012). Spontaneous selection: The influence of product and merchandising factors on consumer impulse purchases. *Journal of Retailing and Consumer Services*, 19(6), 578-588.
- Kacen, J. J., & Lee, J. A. (2002). The influence of culture on consumer impulse buying behavior. *Journal of Consumer Psychology*, 12(2), 163–176.
- Kamaal, E., Mehmood, M. A., Janjua, Q., Zaman, K. U., & Aftab, F. (2024). Investigating the relationship between clothing store environment and impulse buying behavior. *Remittances Review*, 9(1), 1611-1628.
- Karagöz, Y. (2021). *SPSS ve AMOS 24 uygulamalı istatistiksel analizler* (3rd ed.). Nobel Yayıncılık.
- Karbasivar, A., & Yarahmadi, H. (2011). Evaluating effective factors on consumer impulse buying behavior. *Asian Journal of Business Management Studies*, 2(4), 174–181.
- Katakam, A., Dmitrieva, D., & Mendez, F. (2021a). Impulsive buying behavior: An empirical investigation of the role of normative influences and scope of engagement. *Journal of Marketing Theory and Practice*, 29(3), 290–309.  
<https://doi.org/10.1177/1059601120970460>

- Katakam, B. S., Bhukya, R., Bellamkonda, R. S., & Samala, N. (2021b). Longitudinal analysis versus cross-sectional analysis in assessing the factors influencing shoppers' impulse purchase behavior: Do the store ambiance and salesperson interactions really matter? *Journal of Retailing and Consumer Services*, 61, 102586.
- Kerfoot, S., Davies, B., & Ward, P. (2003). Visual merchandising and the creation of discernible retail brands. *International Journal of Retail & Distribution Management*, 31(3), 143–152.
- Kernsom, T., & Sahachaisaeree, N. (2012). Strategic merchandising and effective composition design of window display: A case of large-scale department store in Bangkok. *Procedia - Social and Behavioral Sciences*, 42, 422-428.
- Kim, J. (2003). *College students' apparel impulse buying behaviors in relation to visual merchandising* (Doctoral dissertation). University of Georgia.
- Kim, N., & Lee, H. (2021). Assessing consumer attention and arousal using eye-tracking technology in virtual retail environment. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.665658>
- Kimiagari, S., & Asadi Malafe, N. S. (2021). The role of cognitive and affective responses in the relationship between internal and external stimuli on online impulse buying behavior. *Journal of Retailing and Consumer Services*, 61, 102567. <https://doi.org/10.1016/j.jretconser.2021.102567>
- Kouчекian, M., & Gharibpoor, M. (2012). Investigation the relationship between visual merchandising and customer buying decision: Case study: Isfahan hypermarkets. *International Journal of Academic Research in Economics and Management Sciences*, 1(2), 268-279.
- Krishna, A., Ried, S., & Meixner, M. (2021). State-trait interactions in regulatory focus determine impulse buying behavior. *PLOS One*, 16(7), e0253634.
- Law, D., Wong, C., & Yip, J. (2012). How does visual merchandising affect consumer affective response? *European Journal of Marketing*, 46(1/2), 112–133.

- Lea-Greenwood, G. (1998). Visual merchandising: A neglected area in UK fashion marketing? *International Journal of Retail & Distribution Management*, 26(8), 324–329.
- Lee, H. C., Chen, W. W., & Wang, C. W. (2015). The role of visual art in enhancing perceived prestige of luxury brands. *Marketing Letters*, 26(4), 593–606. <https://doi.org/10.1007/s11002-014-9292-3>
- Lee, J. A., & Kacen, J. J. (2008). Cultural influences on consumer satisfaction with impulse and planned purchase decisions. *Journal of Business Research*, 61(3), 265–272.
- Leong, L.-Y., Jaafar, N. I., & Ainin, S. (2018). The effects of Facebook browsing and usage intensity on impulse purchase in f-commerce. *Computers in Human Behavior*, 78, 160–173.
- Levi, E., & Weitz, S. (2009). *Retailing management* (7th ed.). McGraw Hill.
- Liao, S. L., Shen, Y. C., & Chu, C. H. (2009). The effects of sales promotion strategy, product appeal, and consumer traits on reminder impulse buying behaviour. *International Journal of Consumer Studies*, 33(3), 274–284.
- Liu, F., Li, J., Mizerski, D., & Soh, H. (2012). Self-congruity, brand attitude, and brand loyalty: A study on luxury brands. *European Journal of Marketing*, 46(7/8), 922–937.
- Lim, P.L., & Yazdanifard, R. (2015). What internal and external factors influence impulsive buying behavior in online shopping? *Global Journal of Management and Business Research*, 15(5), 24–32.
- Lo, L. Y.-S., Lin, S.-W., & Hsu, L.-Y. (2016). Motivation for online impulse buying: A two-factor theory perspective. *International Journal of Information Management*, 36(5), 759–772.
- Logkizidou, M. (2016). The impact of the visual merchandise display on consumer purchases of luxury brands: The moderating role of cultural capital (thesis).
- Logkizidou, M. (2021). The neglected unity-in-variety principle: A holistic rather than

- a single-factor approach in conceptualising a visual merchandise display. *Journal of Global Fashion Marketing*, 12(4), 309–326.  
<https://doi.org/10.1080/20932685.2021.1930097>
- Logkizidou, M., Bottomley, P., Angell, R., & Evanschitzky, H. (2019). Why museological merchandise displays enhance luxury product evaluations: An extended art infusion effect. *Journal of Retailing*, 95(1), 67–82.  
<https://doi.org/10.1016/j.jretai.2018.11.001>
- Lucas, M., & Koff, E. (2014). The role of impulsivity and of self-perceived attractiveness in impulse buying in women. *Personality and Individual Differences*, 56, 111-115.
- Luo, X. (2005). How does shopping with others influence impulsive purchasing? *Journal of Consumer Psychology*, 15, 288-294.
- Luo, H., Cheng, S., Zhou, W., Song, W., Yu, S., & Lin, X. (2021). Research on the impact of online promotions on consumers' impulsive online shopping intentions. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(6), 2386–2404.
- Mangleburg, T.F., Doney, P.M., & Bristol, T. (2004). Shopping with friends and teens' susceptibility to peer influence. *Journal of Retailing*, 80(2), 101-116.
- Mathew, R. (2008). *Apparel Merchandising*. Book Enclave.
- Mattila, A. S., & Wirtz, J. (2001). Congruency of scent and music as a driver of in-store evaluations and behavior. *Journal of Retailing*, 77(2), 273–289.  
[https://doi.org/10.1016/S0022-4359\(01\)00042-2](https://doi.org/10.1016/S0022-4359(01)00042-2)
- Mattila, A. S., & Wirtz, J. (2008). The role of store environmental stimulation and social factors on impulse purchasing. *Journal of Services Marketing*, 22, 562-567.
- Mazursky, D., & Jacoby, J. (1986). Exploring the development of store images. *Journal of Retailing*, 62(2), 145–165.
- McGoldrick, P. (1990). *Retail Marketing*. McGraw-Hill.

- Meghanathan, N. (2016). Assortativity analysis of real-world network graphs based on centrality metrics. *Computer and Information Science*.  
<https://www.ccsenet.org/journal/index.php/cis/article/view/59661>
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.
- Mehta, N. P., & Chugan, P. K. (2013). The impact of visual merchandising on impulse buying behaviour of consumer: A case from Central Mall of Ahmedabad India. *Universal Journal of Management*, 1(2), 76-82.  
<https://doi.org/10.13189/ujm.2013.010206>
- Meyers-Levy, J., & Peracchio, L. A. (1992). Getting an angle in advertising: The effect of camera angle on product evaluations. *Journal of Marketing Research*, 29(4), 454–461. <https://doi.org/10.1177/002224379202900406>
- Miao, L. (2011). Guilty pleasure or pleasurable guilt? Affective experience of impulse buying in hedonic-driven consumption. *Journal of Hospitality and Tourism Research*, 35(1), 79–101.
- Miao, M., Jalees, T., Qabool, S., & Zaman, S. I. (2019). The effects of personality, culture and store stimuli on impulsive buying behavior. *Asia Pacific Journal of Marketing and Logistics*, 31(1), 188–204.
- Mills, K. H., Paul, J. E., & Moorman, K. B. (1995). *Applied visual merchandising* (3rd ed.). Prentice-Hall.
- Mohan, G., Sivakumaran, B., & Sharma, P. (2013). Impact of store environment on impulse buying behavior. *European Journal of Marketing*, 47(10), 1711–1732.
- Moore, C.M., Doherty, A.M., & Doyle, S.A. (2010). Flagship stores as a market entry method: The perspective of luxury fashion retailing. *European Journal of Marketing*, 44(1/2), 139–161.
- Morrow, P. C., & McElroy, J. C. (1981). Interior office design and visitor response: A constructive replication. *Journal of Applied Psychology*, 66(5), 646.  
<https://doi.org/10.1037/0021-9010.66.5.646>

- Murray, H.A. (1938). *Explorations in personality*. Oxford University Press.
- Murray, J., Teller, C., & Elms, J. (2019). Examining store atmosphere appraisals using parallel approaches from the aesthetics literature. *Journal of Marketing Management*, 35(9–10), 916–939.  
<https://doi.org/10.1080/0267257X.2019.1618365>
- Muruganantham, G., & Bhakat, R. S. (2013). A review of impulse buying behavior. *International Journal of Marketing Studies*, 5, 149-160.
- Nell, E. C. (2017). The impact of sensory environments on consumer buying behaviour: A study of visual displays and sight atmospherics. *Journal of Business and Retail Management Research*, 11(2).
- Niazi, G.S.K., Siddiqui, J., Alishah, B., & Hunjra, A.I. (2012). Effective advertising and its influence on consumer buying behavior. *Information Management and Business Review*, 4(3), 114-119.
- O'Brien, C., Kelly, J., Lehane, E., Livingstone, V., Cotter, B., & Butt, A. (2015). Validation and assessment of a technology familiarity score in patients attending a symptomatic breast clinic. *World Journal of Surgery*, 39(10), 2441-2449. <https://doi.org/10.1007/s00268-015-3134-1>
- Oh, J., Florito, S. S., Cho, H., & Hofacker, C. F. (2007). Effects of design factors on store image and expectation of merchandise. *Journal of Retailing and Consumer Services*, 2-12.
- Okada, E. M. (2005). Justification effects on consumer choice of hedonic and utilitarian goods. *Journal of Marketing Research*, 42(1), 43–53.
- Olson, J. C. (1977). Price as an informational cue: Effects on product evaluations. In A. G. Woodside, J. N. Sheth, & P. D. Bennett (Eds.), *Consumer and Industrial Buying Behaviour* (pp. 267–286). American Elsevier.
- Ortega-S, A. A. (2011). Effectively offending to sell: Consumer response to shocking visual merchandising presentations. Colorado: Colorado State University.
- Ortiz Alvarado, N. B., Rodríguez Ontiveros, M., & Quintanilla Domínguez, C. (2020).

- Exploring emotional well-being in Facebook as a driver of impulsive buying: A crosscultural approach. *Journal of International Consumer Marketing*, 32(5), 400–415.
- Özgen, D. S. (2018). *Assessing usability of virtual reality for basic design education* (Master's thesis, Bilkent University, Turkey).
- Park, E. J., Kim, E. Y., & Forney, J. C. (2006). A structural model of fashion-oriented impulse buying behavior. *Journal of Fashion Marketing and Management*, 10, 433-446.
- Park, E. J., Kim, E. Y., Funches, V. M., & Foxx, W. (2012). Apparel product attributes, web browsing, and e-impulse buying on shopping websites. *Journal of Business Research*, 65(11), 1583–1589.
- Park, H. H., Jeon, J. O., & Sullivan, P. (2015). How does visual merchandising in fashion retail stores affect consumers' brand attitude and purchase intention? *The International Review of Retail, Distribution and Consumer Research*, 25(1), 87–104.
- Parker, K. W. (2003). Sign consumption in the 19th-century department store: An examination of visual merchandising in the grand emporiums (1846–1900). *Journal of Sociology*, 39(4), 353–371.
- Peck, J., & Childers, T. L. (2006). If I touch it I have to have it: Individual and environmental influences on impulse purchasing. *Journal of Business Research*, 59(6), 765–769.
- Pegler, M. M., & Bliss, L. L. (2006). *Visual merchandising and display*. Fairchild Publications.
- Pentecost, R., & Andrews, L. (2010). Fashion retailing and the bottom line: The effects of generational cohorts, gender, fashion fanship, attitudes, and impulse buying on fashion expenditure. *Journal of Retailing and Consumer Services*, 17(1), 43-52.
- Phillips, H., & Bradshaw, R. (1993). How customers actually shop: Customer

- interaction with the point of sale. *Journal of Market Research Society*, 35(1), 51-60.
- Piacentini, M., & Mailer, G. (2004). Symbolic consumption in teenagers' clothing choice. *Journal of Consumer Behaviour*, 3(3), 251–262.
- Piligrimienė, Ž., Žukauskaitė, A., Korzilius, H., Banytė, J., & Dovalienė, A. (2020). Internal and external determinants of consumer engagement in sustainable consumption. *Sustainability*, 12(4), 1349. <https://doi.org/10.3390/su12041349>
- Pino, G., Guido, G., & Natarajan, R. (2017). Iconic art infusion in luxury retail strategies: Unveiling the potential. *Journal of Global Scholars of Marketing Science*, 27(2), 136–147. <https://doi.org/10.1080/21639159.2017.1283797>
- Piron, F. (1991). Defining impulse purchasing. *Advances in Consumer Research*, 8, 509-514.
- Podoshen, J. S., & Andrzejewski, S. A. (2012). An examination of the relationships between materialism, conspicuous consumption, impulse buying, and brand loyalty. *Journal of Marketing Theory and Practice*, 20(3), 319-334.
- Pornpitakpan, C., Yuan, Y., & Han, J. H. (2017). The effects of salespersons' retail service quality and consumers' mood on impulse buying. *Australasian Marketing Journal*, 25, 2-11.
- Prashar, S., Parsad, C., & Tata, V. S. (2017). Understanding nature of store ambiance and individual impulse buying tendency on impulse purchasing behaviour: An emerging marketing perspective. *Decision*, 44(4), 297-331.
- Punj, G. (2011). Impulse buying and variety seeking: Similarities and differences. *Journal of Business Research*, 64, 745-748.
- Quartier, K., Vanrie, J., & Van Cleempoel, K. (2009). The interaction between interpreted space, mood, and behavior in retail environments: A conceptual research model. IASDR09 'Design: Rigor and relevance, 2-4.
- Quartier, K., Vanrie, J., & Van Cleempoel, K. (2014). As real as it gets: What role does lighting have on consumer's perception of atmosphere, emotions, and

- behavior? *Journal of Environmental Psychology*, 39, 32–39.  
<https://doi.org/10.1016/j.jenvp.2014.04.005>
- Raju, K. V., Kumar, D. P., & Raju, S. S. (2015). A comprehensive review of impulse purchase process and various factors affecting it. *IOSR Journal of Business and Management*, 17(12), 81–107.
- Ramya, N., & Ali, M. (2016). Factors affecting consumer buying behavior. *International Journal of Applied Research*, 2(10), 76-80.
- Raza, S. H., Khan, M. M., & Iqbal, R. (2024). Virtual reality-based product presentation and consumer inspiration: The role of presentation style. *Journal of Business Research*, 172, 114254.  
<https://doi.org/10.1016/j.jbusres.2024.114254>
- Redine, A., Deshpande, S., Jebarajakirthy, C., & Surachartkumtonkun, J. (2022). Impulse buying: A systematic literature review and future research directions. *International Journal of Consumer Studies*, 47(1), 3–41.  
<https://doi.org/10.1111/ijcs.12862>
- Reynolds-Mcilnay, R., Morrin, M., & Nordfält, J. (2017). How product–environment brightness contrast and product disarray impact consumer choice in retail environments. *Journal of Retailing*, 93(3), 266–282.  
<https://doi.org/10.1016/j.jretai.2017.03.003>
- Roggeveen, A. L., Grewal, D., & Schweiger, E. B. (2020). The DAST framework for retail atmospherics: The impact of in-and out-of-store retail journey touchpoints on the customer experience. *Journal of Retailing*, 96(1), 128–137.
- Rook, D., & Hoch, S. (1985). Consuming impulses. *Advances in Consumer Research*, 7(1), 23-27.
- Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research*, 14(2), 189-197. <http://dx.doi.org/10.1086/209105>
- Rook, D. W., & Gardner, M. P. (1993). In the mood: Impulsive buying's affective antecedents. *Research in Consumer Behavior*, 6(1), 1-28.

- Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. *Journal of Consumer Research*, 22(3), 305-313.
- Sadalla, E. K., Vershure, B., & Burroughs, J. (1987). Identity symbolism in housing. *Environment and Behavior*, 19(5), 569–587.  
<https://doi.org/10.1177/0013916587195002>
- Sata, M. (2013). Factors affecting consumer buying behavior of mobile phone devices. *Mediterranean Journal of Social Sciences*.  
<https://doi.org/10.5901/mjss.2013.v4n12p103>
- Satyavani, B., & Chalam, P. G. V. (2018). Online impulse buying behaviour—a suggested approach. *IOSR Journal of Business and Management*, 20(8), 77–83.
- Seinauskiene, B., Mascinskiene, J., Petrike, I., & Rutelion, A. (2016). Materialism as the mediator of the association between subjective well-being and impulsive buying tendency. *Engineering Economics*, 27(5), 594-626.
- Sen, S., Block, L. G., & Chandran, S. (2002). Window displays and consumer shopping decisions. *Journal of Retailing and Consumer Services*, 9(5), 277–290.
- Seock, Y.-K., & Bailey, L. R. (2008). The influence of college students' shopping orientations and gender differences on online information searches and purchase behaviours. *International Journal of Consumer Studies*, 32(2), 113–121. <https://doi.org/10.1111/j.1470-6431.2007.00647.x>
- Seock, Y. K., & Young, E. L. (2013). Understanding the importance of visual merchandising on store image and shopper behaviours in home furnishings retail setting. *European Journal of Business and Management*, 5, 174-187.
- Sevilla, J., & Kahn, B. E. (2016). Space-to-Product Ratio: Store Image and Product Value. *Journal of Retailing*, 92(4), 444-458.
- Sevilla, J., & Townsend, C. (2016). The space-to-product ratio effect: How interstitial space influences product aesthetic appeal, store perceptions, and product preference. *Journal of Marketing Research*, 53(5), 665–681.

<https://doi.org/10.1509/jmr.13.0601>

- Shamri, S. N., Mohd Suhaimi, N. A., & Alwi@Ali, A. (2021). The factors affecting the consumer buying behaviour towards local brand of food product in Selangor. *Journal Of Agrobiotechnology*, 12(1S), 40–50.  
<https://doi.org/10.37231/jab.2021.12.1s.269>
- Sharma, S., Jawajala, R. P., Jawajala, A. R., & Sharma, M. (2022). To study the influence of antecedents, Consumer Lifestyles and Consumer Involvement: Determining the mediating role of Visual Merchandising. *Palgrave Studies in Democracy, Innovation, and Entrepreneurship for Growth*, 359–379.  
[https://doi.org/10.1007/978-3-031-12217-0\\_18](https://doi.org/10.1007/978-3-031-12217-0_18)
- Sharma, P., Sivakumaran, B., & Marshall, R. (2010). Impulse buying and variety seeking: A trait-correlates perspective. *Journal of Business Research*, 63, 276–283.
- Sherman, E., Mathur, A., & Smith, R. B. (1997). Store environment and consumer purchase behavior: Mediating role of consumer emotions. *Psychology & Marketing*, 14(4), 361–378.
- Shukla, P., & Purani, K. (2012). Comparing the importance of luxury value perceptions in cross-national contexts. *Journal of Business Research*, 65(10), 1417–1424.
- Silvera, D., Lavack, A., & Kropp, F. (2008). Impulse buying: The role of affect, social influence, and subjective wellbeing. *Journal of Consumer Marketing*, 25(1), 23–33.
- Skandrani, H., Mouelhi, N. B. D., & Malek, F. (2011). Effect of store atmospherics on employees' reactions. *International Journal of Retail & Distribution Management*, 39(1), 51–67.
- Spence, C., & Gallace, A. (2011). Multisensory design: Reaching out to touch the consumer. *Psychology & Marketing*, 28(3), 267–308.  
<https://doi.org/10.1002/mar.20392>
- Spence, C., Puccinelli, N. M., Grewal, D., & Roggeveen, A. L. (2014). Store

- atmospherics: A multisensory perspective. *Psychology & Marketing*, 31(7), 472–488. <https://doi.org/10.1002/mar.20709>
- Stern, H. (1962). The significance of impulse buying today. *Journal of Marketing*, 26(2), 59-62. <http://dx.doi.org/10.2307/1248439>
- Summers, T. A., & Hebert, P. R. (2001). Shedding some light on store atmospherics: Influence of illumination on consumer behavior. *Journal of Business Research*, 54(2), 145–150. [https://doi.org/10.1016/S0148-2963\(99\)00082-X](https://doi.org/10.1016/S0148-2963(99)00082-X)
- Sun, G., Han, X., Wang, H., Li, J., & Wang, W. (2021). The influence of face loss on impulse buying: An experimental study. *Frontiers in Psychology*, 12, 3080.
- Sundstrom, M., Hjelm-Lidholm, S., & Radon, A. (2019). Clicking the boredom away: Exploring impulse fashion buying behavior online. *Journal of Retailing and Consumer Services*, 47, 150-156.
- Suryawardani, B., Sastika, W., & Hanifa, F.H. (2017). Impulsive buying behavior in Bandung: External and internal stimuli. *Pertanika Journal of Social Science and Humanities*, 25, 59–68.
- Swami, V., Malpass, F., Havard, D., Benford, K., Costescu, A., Sofitiki, A., & Taylor, D. (2013). Metalheads: The influence of personality and individual differences on preference for heavy metal. *Psychology of Aesthetics, Creativity, and the Arts*, 7(4), 377-386.
- Tan, L., Li, H., Chang, Y.-W., Chen, J., & Liou, J.-W. (2023). How to motivate consumers' impulse buying and repeat buying? The role of marketing stimuli, situational factors and personality. *Current Psychology*. <https://doi.org/10.1007/s12144-022-04230-4>
- Thomas, D. (2007). *Deluxe: How luxury lost its luster*. New York: Penguin Press.
- Tifferet, S., & Herstein, R. (2012). Gender differences in brand commitment, impulse buying, and hedonic consumption. *Journal of Product and Brand Management*, 21(3), 176-182.
- Tlapana, T. (2021). The impact of store layout on consumer buying behaviour: A case

- of convenience stores from a selected township in KwaZulu Natal.  
*International Review of Management and Marketing*, 11(5), 1–6.  
<https://doi.org/10.32479/irmm.11583>
- Tullman, M. L., & Rose, C. K. (2004). Revitalizing visual merchandising: Restoring balance to the retail environment entails engaging all five senses, 1-2.
- Turley, L. W., & Milliman, R. E. (2000). Atmospheric effects on shopping behaviour: A review of the experimental evidence. *Journal of Business Research*, 49(2), 193–211.
- Ünal, S. (2008). *İçgüdüsel alışveriş*. Detay Yayıncılık.
- Verplanken, B., & Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. *European Journal of Personality*, 15, S71–S83.
- Verplanken, B., Herabadi, A. G., Perry, J. A., & Silvera, D. H. (2005). Consumer style and health: The role of impulsive buying in unhealthy eating. *Psychology and Health*, 20, 429-411.
- Vohs, K. D., & Faber, R. J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of Consumer Research*, 33(4), 537-547. <https://doi.org/10.1086/510228>
- Vukadin, A., Lemoine, J. F., & Badot, O. (2016). Opportunities and risks of combining shopping experience and artistic elements in the same store: A contribution to the magical functions of the point of sale. *Journal of Marketing Management*, 32(9–10), 944–964. <https://doi.org/10.1080/0267257X.2016.1186106>
- Walter, D., & White, D. (1987). *Retail marketing management*. Basingstoke: Macmillan Press.
- Webster, M., & Sell, J. (Eds.). (2014). *Laboratory experiments in the social sciences* (2nd ed.). London: Elsevier.
- Widayati, C. C., Ali, H., Permana, D., Riyadi, M., Mercu, U., & Jakarta, B. (2019). The effect of visual merchandising, sales promotion, and positive emotion of

- consumers on impulse buying behavior. *Journal of Marketing and Consumer Research*, 60, 56-65.
- Wiid, J. A. (2012). *Fundamentals of merchandising*. Juta: Cape Town.
- Wood, M. (1998). Socio-economic status, delay of gratification, and impulse buying. *Journal of Economic Psychology*, 19, 295-320.
- Wu, J., Kim, A., & Koo, J. (2015). Co-design visual merchandising in 3D virtual stores: A facet theory approach. *International Journal of Retail & Distribution Management*, 43(6), 538–560.
- Xu, H. Q., Zhang, K. Z. K., & Zhao, S. J. (2020). A dual systems model of online impulse buying. *Industrial Management & Data Systems*, 120(5), 845–861.
- Xu, Y., & Huang, J. S. (2014). Effects of price discounts and bonus packs on online impulse buying. *Soc. Behav. Pers.*, 42(8), 1293–1302.
- Youn, S., & Faber, R. J. (2000). Impulse buying: Its relation to personality traits and cues. *Advances in Consumer Research*, 27(2), 179-186.
- Yu, C., & Bastin, M. (2010). Hedonic shopping value and impulse buying behavior in transitional economies: A symbiosis in the mainland China marketplace. *Brand Management*, 18(2), 105-114.
- Yun, Z. S., & Good, L. K. (2007). Developing customer loyalty from e-tail store image attributes. *Managing Service Quality: An International Journal*.
- Zafar, A. U., Qiu, J., & Shahzad, M. (2020). Do digital celebrities' relationships and social climate matter? Impulse buying in f-commerce. *Internet Research*, 30(6), 1731–1762.
- Zafar, A. U., Qiu, J., Li, Y., Wang, J., & Shahzad, M. (2021). The impact of social media celebrities' posts and contextual interactions on impulse buying in social commerce. *Computers in Human Behavior*, 115, 106178.
- Zheng, X., Men, J., Yang, F., & Gong, X. (2019). Understanding impulse buying in mobile commerce: An investigation into hedonic and utilitarian browsing.

*International Journal of Information Management*, 48, 151–160.

- Zhu, R., & Meyers-Levy, J. (2009). The influence of self-view on context effects: How display fixtures can affect product evaluations. *Journal of Marketing Research*, 46(1), 37–45. <https://doi.org/10.1509/jmkr.46.1.37>
- Zibafar, A., Saffari, E., Alemi, M., Meghdari, A., Faryan, L., Pour, A. G., & Taheri, A. (2019). State-of-the-art visual merchandising using a fashionable social robot: RoMa. *International Journal of Social Robotics*, 1–15.
- Zolkifly, N. H., & Baharom, S. N. (2016). Selling cars through visual merchandising: Proposing emotional design approach. *Procedia Economics and Finance*, 37, 412-417.
- Zuo, A. (2024). Research on excessive consumption of luxury goods by the “Generation Z.” *Finance & Economics*, 1(4).  
<https://doi.org/10.61173/hfvffk80>
- Zweigenhaft, R. L. (1976). Personal space in the faculty office: Desk placement and the student-faculty interaction. *Journal of Applied Psychology*, 61(4), 529.  
<https://doi.org/10.1037/0021-9010.61.4.529>

## APPENDICES



## **APPENDIX A. Student Consent Form**

Participant Code: \_\_\_\_\_

### **Title of the Study**

Effect of Visual Stimuli on Impulse Buying Behavior: The Case of High Image Visual Merchandising Display Cues

### **Purpose of the Study**

This research investigates the effect of visual merchandising display cues such as high-image and low-image on impulse buying behavior. As a participant, you are responsible for 3 experiment settings related to this research, where only one variable changes at a time. Please note that students who have the potential of being graded by the investigators during or following the semester(s) in which the study is being carried out will not be able to participate in this study. This research is related to my MFA study at Bilkent University. In this study, undergraduate and graduate students from Bilkent University who are over 18 years old will join the experiment using Virtual Reality (VR) equipment. This study begins in September 2024.

### **Participation**

I am one of the approximately 78 participants who will participate in this research study. My participation is entirely voluntary. I feel comfortable in taking part in this research. As a participant, I can decide to withdraw from involvement while informing the investigator at any stage of the experiment, or I can be excluded from the research if necessary. I know that my relationship with Bilkent University and my academic evaluation will not be affected if I don't participate or withdraw from participation. Also, if I have any questions regarding this research, I can contact the investigator, the advisor of the investigator, or the Bilkent University Local Ethics Committee.

### **Procedure**

As a participant in this research, I will:

1. Explore and interact with the virtual visual merchandising display scenes using HTC Vive VR technology.
2. Fill out the Visual Merchandising Display Cues Scale related to the visual merchandising display cue shown in the scene. These steps will be repeated for three different VMD cues.
3. Fill out the Demographic Questionnaire covering information about my age, gender, education level, major, shopping frequency, and annual household income.
4. Fill out the Technology Familiarity Tests (TFT), and the Impulse Buying Tendency Scale.

I will be given information about each questionnaire before filling it.

### **Risks and Benefits**

There will be no direct benefit to me from this study. However, the findings could contribute to the interior design field. Participating in this research will help the investigator collect the necessary data to gain knowledge of how visual merchandising display cues affect the impulse buying behavior of consumers. I understand that this research will not cause me any harm; participation in this study causes no known or expected risks. Participants with serious dizziness when using VR equipment or low vision, which made it difficult to distinguish the visual stimuli, will be excluded from the study to maintain the validity of the results.

I understand that there will be a prescreening process for participants so any conditions that could be adversely affected by VR, such as epilepsy could be identified. Also, all participants will be informed about potential side effects of VR use, even if they are less significant, such as motion sickness or eye strain, so that they are fully aware of the risks and can make an informed decision about their involvement.

### **Compensation**

I will not be compensated for my participation in this research. No money will be paid for participating in this research study, nor will extra credits be given to my courses.

### **Anonymity and Confidentiality**

Any information obtained about this research study will be reported and published for scientific purposes. As a participant, any information about my identity will remain confidential and placed in the investigator's locked, secure storage for two years after the completion of the research.

### Statement of Consent

*I accept that I have read and understood this form by signing below. I have asked all my questions and understand what I am being asked to do. By signing below, I accept that I am willing and would like to participate in this study.*

Name of the Participant: \_\_\_\_\_

☐ I am above 18 years old.

\_\_\_\_\_  
Signature of the Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of the Investigator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of the Advisor

\_\_\_\_\_  
Date

### Information about the Investigator:

Rümeysa Demirel,  
MFA student at Bilkent University,  
Department of Interior Architecture and Environmental Design  
E-mail: [rumeysa.demirel@bilkent.edu.tr](mailto:rumeysa.demirel@bilkent.edu.tr)

### Information about the Advisor:

Prof. Dr. Halime Demirkan,  
Department of Interior Architecture and Environmental Design  
E-mail: [demirkan@bilkent.edu.tr](mailto:demirkan@bilkent.edu.tr)

## APPENDIX B. Ethical Approvals



**Bilkent Üniversitesi**

Sayı : E-19220902-600.605-49277  
Konu : 590 no.lu Etik Onay Başvurusu

07/10/2024

Sayın Prof. Dr. Halime DEMİRKAN

Danışmanı olduğunuz, Üniversitemiz Mühendislik ve Fen Bilimleri Enstitüsü, İç Mimarlık ve Çevre Tasarımı Ana Bilim Dalı yüksek lisans öğrencisi Rümeysa Demirel'in 590 no.lu "Effect of Visual Stimuli on Impulse Buying Behavior: The Case of High Image Visual Merchandising Display Cues." adlı çalışma kapsamında yapmayı önerdiğiniz etkinlik için yaptığınız başvuru Bilkent Üniversitesi, İnsan Araştırmaları Etik Kurulu'nun 27/09/2024 tarih ve İAEK\_2024\_09\_27\_01 sayılı toplantısında görüşülmüş olup etkinliğin genel bilim etiği açısından uygun olduğuna karar verilmiştir.

Bu karar, yapmayı önerdiğiniz çalışmanın genel bilim etiği açısından bir değerlendirmesi olup, çalışmanızda, kurumumuzun değerlendirmesi dışında kalabilen özel etik ve yasal sınırlamalara uymakla ayrıca yükümlü olduğunuzu bildiririz.

Kurul kararı ekte sunulmaktadır.  
Bilgilerinizi rica ederim.

Prof. Dr. Halil Altay GÜVENİR  
Bilkent Üniversitesi İnsan Araştırmaları Etik Kurul Başkanı

Ek: Karar

**Bu belge, güvenli elektronik imza ile imzalanmıştır.**

Evrak doğrulama <https://ebys-dogrulama.bilkent.edu.tr/> adresinden c655f44f kodu ile yapılabilir.

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Bilgi için: Birgül BULUT  
Yönetici Sekreteri  
Telefon No: 0 312 29012 14





Toplantı Tarihi : 27/09/2024  
Toplantı No : İAEK\_2024\_09\_27\_01  
Saat : 17:00

**Üyeler:** Prof. Dr. Halil Altay Güvenir (Başkan), Bilgisayar Mühendisliği  
Doç. Dr. Işık Yuluğ, Moleküler Biyoloji ve Genetik  
Dr. Öğr. Üyesi Burcu Ayşen Ürgen, Psikoloji  
Dr. Öğr. Üyesi Arif Barış Özbilen, Hukuk  
Uzman Öğretim Görevlisi Dr. Emine Öncüler Yayalar, Siyaset Bilimi ve Kamu Yönetimi  
Prof. Dr. Özgür Ulusoy (Yedek Üye), Bilgisayar Mühendisliği  
Dr. Öğr. Üyesi Şemsi Barış Özçelik (Yedek Üye), Hukuk

**Gündem:** 590 no.lu "Effect of Visual..." adlı çalışma için etik kurul onay başvurusu.

**Karar:** Bilkent Üniversitesi, Güzel Sanatlar, Tasarım ve Mimarlık Fakültesi öğretim üyesi Prof. Dr. Halime Demirkan danışmanlığında, İç Mimarlık ve Çevre Tasarımı Ana Bilim Dalı yüksek lisans öğrencisi Rümeyşa Demirel'in 590 no.lu "Effect of Visual Stimuli on Impulse Buying Behavior: The Case of High Image Visual Merchandising Display Cues." adlı çalışması kapsamında yapmayı önerdikleri etkinliğin genel bilim etiği açısından uygun olduğuna, uygunluk verilen çalışma önerisinin karar ekinde yer alan çalışma önerisi, çalışma yürütücüleri ve bilgilendirme formu için geçerli olduğuna, toplantıya katılan üyelerin oy birliği ile karar verildi.

Prof. Dr. Halil Altay GÜVENİR  
Başkan  
Katıldı

Doç. Dr. Işık YULUĞ  
Üye  
Toplantıya Katılmadı

Dr. Öğr. Üyesi Burcu Ayşen ÜRGEN  
Üye  
Katıldı

Dr. Öğr. Üyesi Arif Barış ÖZBİLEN  
Üye  
Toplantıya Katılmadı

Dr. Emine ÖNCÜLER YAYALAR  
Üye  
Katıldı

Prof. Dr. Özgür ULUSOY  
Yedek Üye  
Katıldı

**Bu belge, güvenli elektronik imza ile imzalanmıştır.**

Evrak doğrulama <https://ebys-dogrulama.bilkent.edu.tr/> adresinden 06ce81e0 kodu ile yapılabilir.

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## APPENDIX C. Virtual Reality Tool

*The VR tool used in this study to experience the visual merchandising cues in a virtual store environment is the HTC Vive Pro.*

*The HTC Vive Pro VR equipment is a Head Mounted Display (HMD) high-tech visual consisting of a headset, two wireless controllers, and two sensors (see Figure x).*



**Figure X.** HTC Vive Pro tool, retrieved from <https://go.vive.com/pro>

## APPENDIX D. Visual Merchandising Display Cues Scale

Participant Code: \_\_\_\_\_

*The following questions aim to assess the impact of visual merchandising display (VMD) cues on your impulse buying behavior. Please think about how you felt during the experiment and rate the following VMD cue related to the scene that you experienced on a 7-point Likert scale. You will be provided with the definition of each cue in both Turkish and English. The rating will be done orally while the participant is still in the VR and the investigator will be taking notes.*

- *Impulse buying behavior* is the unplanned decision to purchase a service or product right before making the purchase (Hussain & Ali, 2016).
- *Visual merchandising display* is a visual stimulus consumers receive to see and assess a product (Logkizidou, 2021).
- *Organization/density* is the term related to the arrangement and the number of products on display (Joy et al., 2014).
- *The staging technique* refers to product performance, highlighting the product value by referring to the display technique (Dion & Arnould, 2011; Hollenbeck et al., 2008; Logkizidou et al., 2019).
- *Lighting* refers to the lighting styles to emphasize the product on display (Joy et al., 2014; Kerfoot et al., 2003).

|                                                                                                                                                                                          | 1<br>Low | 2 | 3 | 4 | 5 | 6 | 7<br>High |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|---|---|---|---|-----------|
| <b>Scale for Organization/Density</b><br>Please rate the impact of the organization and the density of products within the visual merchandising display on your impulse buying behavior. |          |   |   |   |   |   |           |
| <b>Scale for Staging Technique</b><br>Please rate the impact of the staging technique used in the visual merchandising display on your impulse buying behavior.                          |          |   |   |   |   |   |           |
| <b>Scale for Lighting</b><br>Please rate the impact of the lighting techniques used in the visual merchandising display on your impulse buying behavior.                                 |          |   |   |   |   |   |           |

## APPENDIX E. Demographic Questionnaire

*Please answer the following questions about your socio-demographic variables.*

Participant Code: \_\_\_\_\_

**1. Age:** \_\_\_\_\_

**2. Gender**

- ☐ Female
- ☐ Male
- ☐ Don't want to answer
- ☐ Other

**3. Education Level**

- ☐ Undergraduate
- ☐ Graduate

**4. Major**

- ☐ Economics and Social Sciences
- ☐ Education
- ☐ Engineering and Science
- ☐ Other

**5. Shopping Frequency:**

**How often do you shop for bags in a year?**

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3 and above

**6. Monthly income (i.e., combined family income):**

- a) 0-49.000 tl
- b) 50.000-99.000 tl
- c) 100.000 and over

## APPENDIX F. Technology Familiarity Test (TFT)

Participant Code: \_\_\_\_\_

*Please answer the following questions about your technology familiarity. This test was developed by O'Brien et al. (2015) and adapted from Özgen (2018).*

**1. Have you ever used a computer (i.e., desktop, notebook, or iPad)?**

- a. Yes. Which?    ☐ Desktop    ☐ Notebook    ☐ Tablet  
b. No

**2. How often do you use the computer each week?**

- a. Less than 1 hour/week  
b. Between 1-5 hours/week  
c. More than 5, but less than 10 hours/week  
d. 10 or more hours/week

**3. How long have you been using the computer?**

- a. Less than 6 months  
b. Between 6 months and 1 year  
c. More than 1 year, but less than 5 years  
d. 5 or more years

**4. Have you ever used the Internet?**

- a. Yes  
b. No

**5. How often do you use the Internet each week?**

- a. Less than 1 hour/week  
b. Between 1-5 hours/week  
c. More than 5, but less than 10 hours/week  
d. 10 or more hours/week

**6. How long have you been using the Internet?**

- a. Less than 6 months  
b. Between 6 months and 1 year  
c. More than 1 year, but less than 5 years  
d. 5 or more years

**7. Have you ever used virtual reality system?**

- a. Yes. Which?    ☐ Google cardboard    ☐ VR glass with mobile phone    ☐ HTC Vive Pro  
c. No

**8. How often do you use VR each week?**

- a. Less than 1 hour/week  
b. Between 1-5 hours/week  
c. More than 5, but less than 10 hours/week  
d. 10 or more hours/week

**9. How long have you been using the VR?**

- a. Less than 6 months  
b. Between 6 months and 1 year  
c. More than 1 year, but less than 5 years  
d. 5 or more years

## APPENDIX G. Impulse Buying Tendency Scale

Participant Code: \_\_\_\_\_

*Please answer the following questions about your impulse buying tendency. This measure was developed by Verplanken and Herabadi (2001).*

| Impulse Buying Facet | Item                                                                                          | 1<br>fully<br>disagree | 2 | 3 | 4 | 5 | 6 | 7<br>fully<br>agree |
|----------------------|-----------------------------------------------------------------------------------------------|------------------------|---|---|---|---|---|---------------------|
| Cognitive items      | 1. I usually think carefully before I buy something.                                          |                        |   |   |   |   |   |                     |
|                      | 2. I usually only buy things that I intended to buy.                                          |                        |   |   |   |   |   |                     |
|                      | 3. If I buy something, I usually do that spontaneously.                                       |                        |   |   |   |   |   |                     |
|                      | 4. Most of my purchases are planned in advance.                                               |                        |   |   |   |   |   |                     |
|                      | 5. I only buy things that I really need.                                                      |                        |   |   |   |   |   |                     |
|                      | 6. It is not my style to just buy things.                                                     |                        |   |   |   |   |   |                     |
|                      | 7. I like to compare different brands before I buy one.                                       |                        |   |   |   |   |   |                     |
|                      | 8. Before I buy something I always carefully consider whether I need it.                      |                        |   |   |   |   |   |                     |
|                      | 9. I am used to buying things 'on the spot'.                                                  |                        |   |   |   |   |   |                     |
|                      | 10. I often buy things without thinking.                                                      |                        |   |   |   |   |   |                     |
| Affective items      | 11. It is a struggle to leave nice things I see in a shop.                                    |                        |   |   |   |   |   |                     |
|                      | 12. I sometimes cannot suppress the feeling of wanting to buy something.                      |                        |   |   |   |   |   |                     |
|                      | 13. I sometimes feel guilty after having bought something.                                    |                        |   |   |   |   |   |                     |
|                      | 14. I'm not the kind of person who 'falls in love at first sight' with things I see in shops. |                        |   |   |   |   |   |                     |
|                      | 15. I can become very excited if I see something I would like to buy.                         |                        |   |   |   |   |   |                     |
|                      | 16. I always see something nice whenever I pass by shops.                                     |                        |   |   |   |   |   |                     |
|                      | 17. I find it difficult to pass up a bargain.                                                 |                        |   |   |   |   |   |                     |
|                      | 18. If I see something new, I want to buy it.                                                 |                        |   |   |   |   |   |                     |
|                      | 19. I am a bit reckless in buying things.                                                     |                        |   |   |   |   |   |                     |
|                      | 20. I sometimes buy things because I like buying things, rather than because I need them.     |                        |   |   |   |   |   |                     |

## APPENDIX H. Cover Story

*You are asking to contribute to comprehending consumer attitudes regarding a luxury brand of handbags that was newly introduced to the market. You will experience a VR environment with different scenes to present the company's product to you. The product is a black leather handbag with concealed identifying marks. As for your social status, please consider that you can afford everything you want.*



## **APPENDIX I. Virtual Store Environments with Different Visual Cues: 360-Degree Images Designed and Rendered in SketchUp 2024 and Enscape 4.1**

*A probabilistic ranking will be provided using Qualtrics to rank the scenes. The exposure duration of each visual stimulus is determined to be 30 seconds (Kim & Lee, 2021).*

### **High-image Scene I: Organization/Density**



### **Low-image Scene I: Organization/Density**



**High-image Scene II: Staging Technique**



**Low-image Scene II: Staging Technique**



**High-image Scene III: Lighting**



**Low-image Scene III: Lighting**



## APPENDIX J. Skewness and Kurtosis Values

### Descriptive Statistics

|                                         | N         | Minimum   | Maximum   | Mean      | Std. Deviation |
|-----------------------------------------|-----------|-----------|-----------|-----------|----------------|
|                                         | Statistic | Statistic | Statistic | Statistic | Statistic      |
| Visual Merchandising Display Cues Scale | 84        | 1,00      | 6,33      | 3,9048    | 1,19523        |
| Organization/Density                    | 84        | 1,00      | 6,00      | 3,1071    | 1,53684        |
| Staging Techniques                      | 84        | 1,00      | 7,00      | 4,6310    | 1,49521        |
| Lighting                                | 84        | 1,00      | 7,00      | 3,9762    | 1,76973        |
| Impulse Buying Tendency Scale           | 84        | 1,95      | 6,05      | 3,8976    | ,88491         |
| Cognitive States                        | 84        | 1,70      | 6,30      | 3,7060    | 1,03427        |
| Affective States                        | 84        | 1,70      | 6,20      | 4,0893    | 1,00493        |
| Age                                     | 84        | 18,00     | 33,00     | 21,2857   | 2,81806        |
| Valid N (listwise)                      | 84        |           |           |           |                |

### Descriptive Statistics

|                                         | Skewness  |            | Kurtosis  |            |
|-----------------------------------------|-----------|------------|-----------|------------|
|                                         | Statistic | Std. Error | Statistic | Std. Error |
| Visual Merchandising Display Cues Scale | ,152      | ,263       | -,385     | ,520       |
| Organization/Density                    | ,346      | ,263       | -,892     | ,520       |
| Staging Techniques                      | -,625     | ,263       | -,163     | ,520       |
| Lighting                                | -,137     | ,263       | -,860     | ,520       |
| Impulse Buying Tendency Scale           | -,039     | ,263       | -,342     | ,520       |
| Cognitive States                        | ,066      | ,263       | -,469     | ,520       |
| Affective States                        | -,111     | ,263       | -,135     | ,520       |
| Age                                     | 2,282     | ,263       | 5,830     | ,520       |
| Valid N (listwise)                      |           |            |           |            |

|                       |                             | Image     |            |            |
|-----------------------|-----------------------------|-----------|------------|------------|
|                       |                             | Low Image |            | High Image |
|                       |                             | Count     | Column N % | Count      |
| Gender                | Female                      | 42        | 100,0%     | 41         |
|                       | Other                       | 0         | 0,0%       | 1          |
| Education Level       | Undergraduate               | 34        | 81,0%      | 39         |
|                       | Graduate                    | 8         | 19,0%      | 3          |
| Major                 | Economics & Social Sciences | 10        | 23,8%      | 11         |
|                       | Engineering & Sciences      | 4         | 9,5%       | 1          |
|                       | Other                       | 28        | 66,7%      | 30         |
| Shopping Frequency    | 0                           | 6         | 14,3%      | 2          |
|                       | 1                           | 11        | 26,2%      | 18         |
|                       | 2                           | 13        | 31,0%      | 12         |
|                       | 3 or more                   | 12        | 28,6%      | 10         |
| Monthly Income        | No Response                 | 0         | 0,0%       | 6          |
|                       | 0-49.000 ₺                  | 9         | 21,4%      | 11         |
|                       | 50.000-99.000 ₺             | 18        | 42,9%      | 18         |
|                       | 100,000 ₺ and above         | 15        | 35,7%      | 7          |
| Previous Computer Use | Yes                         | 42        | 100,0%     | 42         |
|                       | No                          | 0         | 0,0%       | 0          |

|                       |                             | Image      |
|-----------------------|-----------------------------|------------|
|                       |                             | High Image |
|                       |                             | Column N % |
| Gender                | Female                      | 97,6%      |
|                       | Other                       | 2,4%       |
| Education Level       | Undergraduate               | 92,9%      |
|                       | Graduate                    | 7,1%       |
| Major                 | Economics & Social Sciences | 26,2%      |
|                       | Engineering & Sciences      | 2,4%       |
|                       | Other                       | 71,4%      |
| Shopping Frequency    | 0                           | 4,8%       |
|                       | 1                           | 42,9%      |
|                       | 2                           | 28,6%      |
|                       | 3 or more                   | 23,8%      |
| Monthly Income        | No Response                 | 14,3%      |
|                       | 0-49.000 ₺                  | 26,2%      |
|                       | 50.000-99.000 ₺             | 42,9%      |
|                       | 100,000 ₺ and above         | 16,7%      |
| Previous Computer Use | Yes                         | 100,0%     |
|                       | No                          | 0,0%       |

*Case Processing Summary*

|                               | Cases |         |         |         |       |         |
|-------------------------------|-------|---------|---------|---------|-------|---------|
|                               | Valid |         | Missing |         | Total |         |
|                               | N     | Percent | N       | Percent | N     | Percent |
| Gender * Image                | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Education Level * Image       | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Major * Image                 | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Shopping Frequency * Image    | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Monthly Income * Image        | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Previous Computer Use * Image | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |

**Gender \* Image**

|        |        | Image           |                 | Total |
|--------|--------|-----------------|-----------------|-------|
|        |        | Low Image       | High Image      |       |
| Gender | Female | 42 <sub>a</sub> | 41 <sub>a</sub> | 83    |
|        | Other  | 0 <sub>a</sub>  | 1 <sub>a</sub>  | 1     |
| Total  |        | 42              | 42              | 84    |

## APPENDIX K. Chi-Square Analysis

|                                    | Value              | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|------------------------------------|--------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square                 | 1,012 <sup>a</sup> | 1  | ,314                                    | 1,000                   | ,500                    |
| Continuity Correction <sup>b</sup> | ,000               | 1  | 1,000                                   |                         |                         |
| Likelihood Ratio                   | 1,398              | 1  | ,237                                    | 1,000                   | ,500                    |
| Fisher's Exact Test                |                    |    |                                         | 1,000                   | ,500                    |
| Linear-by-Linear<br>Association    | 1,000 <sup>c</sup> | 1  | ,317                                    | 1,000                   | ,500                    |
| N of Valid Cases                   | 84                 |    |                                         |                         |                         |

### Chi-Square Tests

|                                    | Point Probability |
|------------------------------------|-------------------|
| Pearson Chi-Square                 |                   |
| Continuity Correction <sup>b</sup> |                   |
| Likelihood Ratio                   |                   |
| Fisher's Exact Test                |                   |
| Linear-by-Linear Association       | ,500              |
| N of Valid Cases                   |                   |

a. 2 cells (50,0%) have expected count less than 5. The minimum expected count is ,50.

b. Computed only for a 2x2 table

c. The standardized statistic is 1,000.

### Education Level \* Image

|                 |               | Image           |                 | Total |
|-----------------|---------------|-----------------|-----------------|-------|
|                 |               | Low Image       | High Image      |       |
| Education Level | Undergraduate | 34 <sub>a</sub> | 39 <sub>a</sub> | 73    |
|                 | Graduate      | 8 <sub>a</sub>  | 3 <sub>a</sub>  | 11    |
| Total           |               | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

### Chi-Square Tests

|                                    | Value              | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|------------------------------------|--------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square                 | 2,615 <sup>a</sup> | 1  | ,106                                    | ,194                    | ,097                    |
| Continuity Correction <sup>b</sup> | 1,674              | 1  | ,196                                    |                         |                         |
| Likelihood Ratio                   | 2,701              | 1  | ,100                                    | ,194                    | ,097                    |
| Fisher's Exact Test                |                    |    |                                         | ,194                    | ,097                    |
| Linear-by-Linear<br>Association    | 2,584 <sup>c</sup> | 1  | ,108                                    | ,194                    | ,097                    |
| N of Valid Cases                   | 84                 |    |                                         |                         |                         |

### Chi-Square Tests

|                                    | Point Probability |
|------------------------------------|-------------------|
| Pearson Chi-Square                 |                   |
| Continuity Correction <sup>b</sup> |                   |
| Likelihood Ratio                   |                   |
| Fisher's Exact Test                |                   |
| Linear-by-Linear Association       | ,073              |
| N of Valid Cases                   |                   |

- a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 5,50.  
b. Computed only for a 2x2 table  
c. The standardized statistic is -1,608.

#### Major \* Image

|       |                             | Image           |                 | Total |
|-------|-----------------------------|-----------------|-----------------|-------|
|       |                             | Low Image       | High Image      |       |
| Major | Economics & Social Sciences | 10 <sub>a</sub> | 11 <sub>a</sub> | 21    |
|       | Engineering & Sciences      | 4 <sub>a</sub>  | 1 <sub>a</sub>  | 5     |
|       | Other                       | 28 <sub>a</sub> | 30 <sub>a</sub> | 58    |
| Total |                             | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

#### Chi-Square Tests

|                              | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square           | 1,917 <sup>a</sup> | 2  | ,384                              | ,494                 |                      |
| Likelihood Ratio             | 2,044              | 2  | ,360                              | ,441                 |                      |
| Fisher's Exact Test          | 1,791              |    |                                   | ,494                 |                      |
| Linear-by-Linear Association | ,000 <sup>b</sup>  | 1  | 1,000                             | 1,000                | ,531                 |
| N of Valid Cases             | 84                 |    |                                   |                      |                      |

#### Chi-Square Tests

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,061              |
| N of Valid Cases             |                   |

- a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,50.  
b. The standardized statistic is ,000.

#### Shopping Frequency \* Image

|                    |           | Image           |                 | Total |
|--------------------|-----------|-----------------|-----------------|-------|
|                    |           | Low Image       | High Image      |       |
| Shopping Frequency | 0         | 6 <sub>a</sub>  | 2 <sub>a</sub>  | 8     |
|                    | 1         | 11 <sub>a</sub> | 18 <sub>a</sub> | 29    |
|                    | 2         | 13 <sub>a</sub> | 12 <sub>a</sub> | 25    |
|                    | 3 or more | 12 <sub>a</sub> | 10 <sub>a</sub> | 22    |
| Total              |           | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                                 | Value              | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|---------------------------------|--------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square              | 3,911 <sup>a</sup> | 3  | ,271                                    | ,293                    |                         |
| Likelihood Ratio                | 4,022              | 3  | ,259                                    | ,289                    |                         |
| Fisher's Exact Test             | 3,809              |    |                                         | ,297                    |                         |
| Linear-by-Linear<br>Association | ,013 <sup>b</sup>  | 1  | ,910                                    | 1,000                   | ,500                    |
| N of Valid Cases                | 84                 |    |                                         |                         |                         |

*Chi-Square Tests*

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,089              |
| N of Valid Cases             |                   |

a. 2 cells (25,0%) have expected count less than 5. The minimum expected count is 4,00.

b. The standardized statistic is -,113.

**Monthly Income \* Image**

|                |                      | Image           |                 | Total |
|----------------|----------------------|-----------------|-----------------|-------|
|                |                      | Low Image       | High Image      |       |
| Monthly Income | No Response          | 0 <sub>a</sub>  | 6 <sub>b</sub>  | 6     |
|                | 0-49.000tl           | 9 <sub>a</sub>  | 11 <sub>a</sub> | 20    |
|                | 50.000-99.000tl      | 18 <sub>a</sub> | 18 <sub>a</sub> | 36    |
|                | 100,000 TL and above | 15 <sub>a</sub> | 7 <sub>b</sub>  | 22    |
| Total          |                      | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                                 | Value              | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|---------------------------------|--------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square              | 9,109 <sup>a</sup> | 3  | ,028                                    | ,026                    |                         |
| Likelihood Ratio                | 11,495             | 3  | ,009                                    | ,014                    |                         |
| Fisher's Exact Test             | 9,160              |    |                                         | ,024                    |                         |
| Linear-by-Linear<br>Association | 7,379 <sup>b</sup> | 1  | ,007                                    | ,009                    | ,004                    |
| N of Valid Cases                | 84                 |    |                                         |                         |                         |

*Chi-Square Tests*

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,002              |
| N of Valid Cases             |                   |

a. 2 cells (25,0%) have expected count less than 5. The minimum expected count is 3,00.

b. The standardized statistic is -2,716.

### Previous Computer Use \* Image

|                       |     | Image           |                 | Total |
|-----------------------|-----|-----------------|-----------------|-------|
|                       |     | Low Image       | High Image      |       |
| Previous Computer Use | Yes | 42 <sub>a</sub> | 42 <sub>a</sub> | 84    |
| Total                 |     | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

### Chi-Square Tests

|                    | Value          |
|--------------------|----------------|
| Pearson Chi-Square | , <sup>a</sup> |
| N of Valid Cases   | 84             |

a. No statistics are computed because Previous Computer Use is a constant.

## APPENDIX L. Mann-Whitney Test

### Ranks

|     | Image      | N  | Mean Rank | Sum of Ranks |
|-----|------------|----|-----------|--------------|
| Age | Low Image  | 42 | 43,80     | 1839,50      |
|     | High Image | 42 | 41,20     | 1730,50      |
|     | Total      | 84 |           |              |

### Test Statistics<sup>a</sup>

|                        | Age      |
|------------------------|----------|
| Mann-Whitney U         | 827,500  |
| Wilcoxon W             | 1730,500 |
| Z                      | -,498    |
| Asymp. Sig. (2-tailed) | ,618     |

a. Grouping Variable: Image

### Custom Tables

|     |       | Image              |        |         |         |            |
|-----|-------|--------------------|--------|---------|---------|------------|
|     |       | Low Image          |        |         |         | High Image |
| Age | Mean  | Standard Deviation | Median | Minimum | Maximum | Mean       |
|     | 21,69 | 3,47               | 21,00  | 18,00   | 33,00   | 20,88      |

|     |                    | Image      |         |         |  |
|-----|--------------------|------------|---------|---------|--|
|     |                    | High Image |         |         |  |
| Age | Standard Deviation | Median     | Minimum | Maximum |  |
|     | 1,92               | 21,00      | 19,00   | 26,00   |  |

## APPENDIX M. Chi-Square Analysis

### Custom Tables

|                                             |                         | Image     |            |            |            |
|---------------------------------------------|-------------------------|-----------|------------|------------|------------|
|                                             |                         | Low Image |            | High Image |            |
|                                             |                         | Count     | Column N % | Count      | Column N % |
| Previous Computer Use                       | Yes                     | 42        | 100,0%     | 42         | 100,0%     |
|                                             | No                      | 0         | 0,0%       | 0          | 0,0%       |
| Frequency of Computer Use                   | Less than 1 hour/week   | 0         | 0,0%       | 1          | 2,4%       |
|                                             | 1-5 hours/week          | 2         | 4,8%       | 4          | 9,5%       |
|                                             | 5-10 hours/week         | 15        | 35,7%      | 6          | 14,3%      |
|                                             | More than 10 hours/week | 25        | 59,5%      | 31         | 73,8%      |
| Duration of Computer Use                    | Less than 6 months      | 1         | 2,4%       | 1          | 2,4%       |
|                                             | 6 months to 1 year      | 1         | 2,4%       | 1          | 2,4%       |
|                                             | 1-5 years               | 8         | 19,0%      | 8          | 19,0%      |
|                                             | 5 years and above       | 32        | 76,2%      | 32         | 76,2%      |
| Previous Internet Use                       | Yes                     | 42        | 100,0%     | 42         | 100,0%     |
|                                             | No                      | 0         | 0,0%       | 0          | 0,0%       |
| Weekly Internet Usage Frequency             | Less than 1 hour/week   | 0         | 0,0%       | 0          | 0,0%       |
|                                             | 1-5 hours/week          | 0         | 0,0%       | 0          | 0,0%       |
|                                             | 5-10 hours/week         | 2         | 4,8%       | 2          | 4,8%       |
|                                             | More than 10 hours/week | 40        | 95,2%      | 40         | 95,2%      |
| Duration of Internet Use                    | Less than 6 months      | 0         | 0,0%       | 0          | 0,0%       |
|                                             | 6 months to 1 year      | 0         | 0,0%       | 0          | 0,0%       |
|                                             | 1-5 years               | 0         | 0,0%       | 1          | 2,4%       |
|                                             | 5 years and above       | 42        | 100,0%     | 41         | 97,6%      |
| Previous Virtual Reality (VR) Use           | Yes                     | 19        | 45,2%      | 19         | 45,2%      |
|                                             | No                      | 23        | 54,8%      | 23         | 54,8%      |
| Weekly Virtual Reality (VR) Usage Frequency | None                    | 23        | 54,8%      | 23         | 54,8%      |
|                                             | Less than 1 hour/week   | 17        | 40,5%      | 19         | 45,2%      |
|                                             | 1-5 hours/week          | 2         | 4,8%       | 0          | 0,0%       |
|                                             | 5-10 hours/week         | 0         | 0,0%       | 0          | 0,0%       |
|                                             | More than 10 hours/week | 0         | 0,0%       | 0          | 0,0%       |
| Frequency of VR Use                         | None                    | 23        | 54,8%      | 23         | 54,8%      |
|                                             | Less than 6 months      | 12        | 28,6%      | 12         | 28,6%      |
|                                             | 6 months - 1 year       | 2         | 4,8%       | 1          | 2,4%       |
|                                             | 1-5 years               | 4         | 9,5%       | 3          | 7,1%       |
|                                             | 5 years and above       | 1         | 2,4%       | 3          | 7,1%       |

### Crosstabs

#### Case Processing Summary

|                                   | Cases |         |         |         |       |         |
|-----------------------------------|-------|---------|---------|---------|-------|---------|
|                                   | Valid |         | Missing |         | Total |         |
|                                   | N     | Percent | N       | Percent | N     | Percent |
| Previous Computer Use * Image     | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Frequency of Computer Use * Image | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |
| Duration of Computer Use * Image  | 84    | 100,0%  | 0       | 0,0%    | 84    | 100,0%  |

|                                                     |    |        |   |      |    |        |
|-----------------------------------------------------|----|--------|---|------|----|--------|
| Previous Internet Use * Image                       | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |
| Weekly Internet Usage Frequency * Image             | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |
| Duration of Internet Use * Image                    | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |
| Previous Virtual Reality (VR) Use * Image           | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |
| Weekly Virtual Reality (VR) Usage Frequency * Image | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |
| Frequency of VR Use * Image                         | 84 | 100,0% | 0 | 0,0% | 84 | 100,0% |

#### Previous Computer Use \* Image

|                       |     | Image           |                 | Total |
|-----------------------|-----|-----------------|-----------------|-------|
|                       |     | Low Image       | High Image      |       |
| Previous Computer Use | Yes | 42 <sub>a</sub> | 42 <sub>a</sub> | 84    |
| Total                 |     | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

#### Chi-Square Tests

|                    | Value          |
|--------------------|----------------|
| Pearson Chi-Square | . <sup>a</sup> |
| N of Valid Cases   | 84             |

a. No statistics are computed because Previous Computer Use is a constant.

#### Frequency of Computer Use \* Image

|                           |                         | Image           |                 | Total |
|---------------------------|-------------------------|-----------------|-----------------|-------|
|                           |                         | Low Image       | High Image      |       |
| Frequency of Computer Use | Less than 1 hour/week   | 0 <sub>a</sub>  | 1 <sub>a</sub>  | 1     |
|                           | 1-5 hours/week          | 2 <sub>a</sub>  | 4 <sub>a</sub>  | 6     |
|                           | 5-10 hours/week         | 15 <sub>a</sub> | 6 <sub>b</sub>  | 21    |
|                           | More than 10 hours/week | 25 <sub>a</sub> | 31 <sub>a</sub> | 56    |
| Total                     |                         | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

#### Chi-Square Tests

|                              | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square           | 6,167 <sup>a</sup> | 3  | ,104                              | ,076                 |                      |
| Likelihood Ratio             | 6,695              | 3  | ,082                              | ,082                 |                      |
| Fisher's Exact Test          | 6,042              |    |                                   | ,070                 |                      |
| Linear-by-Linear Association | ,102 <sup>b</sup>  | 1  | ,749                              | ,874                 | ,437                 |
| N of Valid Cases             | 84                 |    |                                   |                      |                      |

# Chi-Square Tests

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,120              |
| N of Valid Cases             |                   |

- a. 4 cells (50,0%) have expected count less than 5. The minimum expected count is ,50.  
b. The standardized statistic is ,320.

## Duration of Computer Use \* Image

|                          |                    | Image           |                 |       |
|--------------------------|--------------------|-----------------|-----------------|-------|
|                          |                    | Low Image       | High Image      | Total |
| Duration of Computer Use | Less than 6 months | 1 <sub>a</sub>  | 1 <sub>a</sub>  | 2     |
|                          | 6 months to 1 year | 1 <sub>a</sub>  | 1 <sub>a</sub>  | 2     |
|                          | 1-5 years          | 8 <sub>a</sub>  | 8 <sub>a</sub>  | 16    |
|                          | 5 years and above  | 32 <sub>a</sub> | 32 <sub>a</sub> | 64    |
| Total                    |                    | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

# Chi-Square Tests

|                              | Value             | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------|-------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square           | ,000 <sup>a</sup> | 3  | 1,000                             | 1,000                |                      |
| Likelihood Ratio             | ,000              | 3  | 1,000                             | 1,000                |                      |
| Fisher's Exact Test          | ,516              |    |                                   | 1,000                |                      |
| Linear-by-Linear Association | ,000 <sup>b</sup> | 1  | 1,000                             | 1,000                | ,566                 |
| N of Valid Cases             | 84                |    |                                   |                      |                      |

# Chi-Square Tests

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,132              |
| N of Valid Cases             |                   |

- a. 4 cells (50,0%) have expected count less than 5. The minimum expected count is 1,00.  
b. The standardized statistic is ,000.

## Previous Internet Use \* Image

|                       |     | Image           |                 |       |
|-----------------------|-----|-----------------|-----------------|-------|
|                       |     | Low Image       | High Image      | Total |
| Previous Internet Use | Yes | 42 <sub>a</sub> | 42 <sub>a</sub> | 84    |
| Total                 |     | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                    | Value          |
|--------------------|----------------|
| Pearson Chi-Square | , <sup>a</sup> |
| N of Valid Cases   | 84             |

a. No statistics are computed because Previous Internet Use is a constant.

**Weekly Internet Usage Frequency \* Image**

|                                 |                         | Image           |                 | Total |
|---------------------------------|-------------------------|-----------------|-----------------|-------|
|                                 |                         | Low Image       | High Image      |       |
| Weekly Internet Usage Frequency | 5-10 hours/week         | 2 <sub>a</sub>  | 2 <sub>a</sub>  | 4     |
|                                 | More than 10 hours/week | 40 <sub>a</sub> | 40 <sub>a</sub> | 80    |
| Total                           |                         | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                                    | Value             | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|-------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square                 | ,000 <sup>a</sup> | 1  | 1,000                             | 1,000                | ,692                 |
| Continuity Correction <sup>b</sup> | ,000              | 1  | 1,000                             |                      |                      |
| Likelihood Ratio                   | ,000              | 1  | 1,000                             | 1,000                | ,692                 |
| Fisher's Exact Test                |                   |    |                                   | 1,000                | ,692                 |
| Linear-by-Linear Association       | ,000 <sup>c</sup> | 1  | 1,000                             | 1,000                | ,692                 |
| N of Valid Cases                   | 84                |    |                                   |                      |                      |

*Chi-Square Tests*

|                                    | Point Probability |
|------------------------------------|-------------------|
| Pearson Chi-Square                 |                   |
| Continuity Correction <sup>b</sup> |                   |
| Likelihood Ratio                   |                   |
| Fisher's Exact Test                |                   |
| Linear-by-Linear Association       | ,384              |
| N of Valid Cases                   |                   |

a. 2 cells (50,0%) have expected count less than 5. The minimum expected count is 2,00.

b. Computed only for a 2x2 table

c. The standardized statistic is ,000.

**Duration of Internet Use \* Image**

|                          |                   | Image           |                 | Total |
|--------------------------|-------------------|-----------------|-----------------|-------|
|                          |                   | Low Image       | High Image      |       |
| Duration of Internet Use | 1-5 years         | 0 <sub>a</sub>  | 1 <sub>a</sub>  | 1     |
|                          | 5 years and above | 42 <sub>a</sub> | 41 <sub>a</sub> | 83    |
| Total                    |                   | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                                    | Value              | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|------------------------------------|--------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square                 | 1,012 <sup>a</sup> | 1  | ,314                                    | 1,000                   | ,500                    |
| Continuity Correction <sup>b</sup> | ,000               | 1  | 1,000                                   |                         |                         |
| Likelihood Ratio                   | 1,398              | 1  | ,237                                    | 1,000                   | ,500                    |
| Fisher's Exact Test                |                    |    |                                         | 1,000                   | ,500                    |
| Linear-by-Linear<br>Association    | 1,000 <sup>c</sup> | 1  | ,317                                    | 1,000                   | ,500                    |
| N of Valid Cases                   | 84                 |    |                                         |                         |                         |

*Chi-Square Tests*

|                                    | Point Probability |
|------------------------------------|-------------------|
| Pearson Chi-Square                 |                   |
| Continuity Correction <sup>b</sup> |                   |
| Likelihood Ratio                   |                   |
| Fisher's Exact Test                |                   |
| Linear-by-Linear Association       | ,500              |
| N of Valid Cases                   |                   |

a. 2 cells (50,0%) have expected count less than 5. The minimum expected count is ,50.

b. Computed only for a 2x2 table

c. The standardized statistic is -1,000.

**Previous Virtual Reality (VR) Use \* Image**

|                                   |     | Image           |                 | Total |
|-----------------------------------|-----|-----------------|-----------------|-------|
|                                   |     | Low Image       | High Image      |       |
| Previous Virtual Reality (VR) Use | Yes | 19 <sub>a</sub> | 19 <sub>a</sub> | 38    |
|                                   | No  | 23 <sub>a</sub> | 23 <sub>a</sub> | 46    |
| Total                             |     | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

*Chi-Square Tests*

|                                    | Value             | df | Asymptotic<br>Significance<br>(2-sided) | Exact Sig.<br>(2-sided) | Exact Sig.<br>(1-sided) |
|------------------------------------|-------------------|----|-----------------------------------------|-------------------------|-------------------------|
| Pearson Chi-Square                 | ,000 <sup>a</sup> | 1  | 1,000                                   | 1,000                   | ,587                    |
| Continuity Correction <sup>b</sup> | ,000              | 1  | 1,000                                   |                         |                         |
| Likelihood Ratio                   | ,000              | 1  | 1,000                                   | 1,000                   | ,587                    |
| Fisher's Exact Test                |                   |    |                                         | 1,000                   | ,587                    |
| Linear-by-Linear<br>Association    | ,000 <sup>c</sup> | 1  | 1,000                                   | 1,000                   | ,587                    |
| N of Valid Cases                   | 84                |    |                                         |                         |                         |

*Chi-Square Tests*

|                                    | Point Probability |
|------------------------------------|-------------------|
| Pearson Chi-Square                 |                   |
| Continuity Correction <sup>b</sup> |                   |
| Likelihood Ratio                   |                   |
| Fisher's Exact Test                |                   |
| Linear-by-Linear Association       | ,173              |
| N of Valid Cases                   |                   |

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 19,00.

b. Computed only for a 2x2 table

c. The standardized statistic is ,000.

#### Weekly Virtual Reality (VR) Usage Frequency \* Image

|                                             |                       | Image           |                 | Total |
|---------------------------------------------|-----------------------|-----------------|-----------------|-------|
|                                             |                       | Low Image       | High Image      |       |
| Weekly Virtual Reality (VR) Usage Frequency | None                  | 23 <sub>a</sub> | 23 <sub>a</sub> | 46    |
|                                             | Less than 1 hour/week | 17 <sub>a</sub> | 19 <sub>a</sub> | 36    |
|                                             | 1-5 hours/week        | 2 <sub>a</sub>  | 0 <sub>a</sub>  | 2     |
| Total                                       |                       | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

#### Chi-Square Tests

|                              | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square           | 2,111 <sup>a</sup> | 2  | ,348                              | ,469                 |                      |
| Likelihood Ratio             | 2,884              | 2  | ,236                              | ,469                 |                      |
| Fisher's Exact Test          | 1,755              |    |                                   | ,543                 |                      |
| Linear-by-Linear Association | ,158 <sup>b</sup>  | 1  | ,691                              | ,842                 | ,421                 |
| N of Valid Cases             | 84                 |    |                                   |                      |                      |

#### Chi-Square Tests

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,146              |
| N of Valid Cases             |                   |

a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 1,00.

b. The standardized statistic is -,398.

#### Frequency of VR Use \* Image

|                     |                    | Image           |                 | Total |
|---------------------|--------------------|-----------------|-----------------|-------|
|                     |                    | Low Image       | High Image      |       |
| Frequency of VR Use | None               | 23 <sub>a</sub> | 23 <sub>a</sub> | 46    |
|                     | Less than 6 months | 12 <sub>a</sub> | 12 <sub>a</sub> | 24    |
|                     | 6 months - 1 year  | 2 <sub>a</sub>  | 1 <sub>a</sub>  | 3     |
|                     | 1-5 years          | 4 <sub>a</sub>  | 3 <sub>a</sub>  | 7     |
|                     | 5 years and above  | 1 <sub>a</sub>  | 3 <sub>a</sub>  | 4     |
| Total               |                    | 42              | 42              | 84    |

Each subscript letter denotes a subset of Image categories whose column proportions do not differ significantly from each other at the ,05 level.

#### Chi-Square Tests

|                              | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square           | 1,476 <sup>a</sup> | 4  | ,831                              | ,898                 |                      |
| Likelihood Ratio             | 1,530              | 4  | ,821                              | ,877                 |                      |
| Fisher's Exact Test          | 1,568              |    |                                   | ,898                 |                      |
| Linear-by-Linear Association | ,081 <sup>b</sup>  | 1  | ,776                              | ,851                 | ,426                 |

N of Valid Cases 84

*Chi-Square Tests*

|                              | Point Probability |
|------------------------------|-------------------|
| Pearson Chi-Square           |                   |
| Likelihood Ratio             |                   |
| Fisher's Exact Test          |                   |
| Linear-by-Linear Association | ,072              |
| N of Valid Cases             |                   |

- a. 6 cells (60,0%) have expected count less than 5. The minimum expected count is 1,50.  
b. The standardized statistic is ,285.

## APPENDIX N. Correlations

**Correlations**

*Correlations*

|                                         |                     | Image  | Visual Merchandising Display Cues Scale | Organization/Density |
|-----------------------------------------|---------------------|--------|-----------------------------------------|----------------------|
| Image                                   | Pearson Correlation | 1      | ,508**                                  | ,242*                |
|                                         | Sig. (2-tailed)     |        | ,000                                    | ,027                 |
|                                         | N                   | 84     | 84                                      | 84                   |
| Visual Merchandising Display Cues Scale | Pearson Correlation | ,508** | 1                                       | ,694**               |
|                                         | Sig. (2-tailed)     | ,000   |                                         | ,000                 |
|                                         | N                   | 84     | 84                                      | 84                   |
| Organization/Density                    | Pearson Correlation | ,242*  | ,694**                                  | 1                    |
|                                         | Sig. (2-tailed)     | ,027   | ,000                                    |                      |
|                                         | N                   | 84     | 84                                      | 84                   |
| Staging Techniques                      | Pearson Correlation | ,280** | ,688**                                  | ,154                 |
|                                         | Sig. (2-tailed)     | ,010   | ,000                                    | ,163                 |
|                                         | N                   | 84     | 84                                      | 84                   |
| Lighting                                | Pearson Correlation | ,582** | ,842**                                  | ,408**               |
|                                         | Sig. (2-tailed)     | ,000   | ,000                                    | ,000                 |
|                                         | N                   | 84     | 84                                      | 84                   |
| Impulse Buying Tendency Scale           | Pearson Correlation | ,148   | ,059                                    | ,005                 |
|                                         | Sig. (2-tailed)     | ,181   | ,591                                    | ,967                 |
|                                         | N                   | 84     | 84                                      | 84                   |

|                  |                     |      |      |       |
|------------------|---------------------|------|------|-------|
| Cognitive States | Pearson Correlation | ,138 | ,027 | -,034 |
|                  | Sig. (2-tailed)     | ,211 | ,804 | ,760  |
|                  | N                   | 84   | 84   | 84    |
| Affective States | Pearson Correlation | ,118 | ,076 | ,043  |
|                  | Sig. (2-tailed)     | ,285 | ,490 | ,699  |
|                  | N                   | 84   | 84   | 84    |

#### *Correlations*

|                                            |                     | Staging<br>Techniques | Lighting | Impulse<br>Buying<br>Tendency<br>Scale |
|--------------------------------------------|---------------------|-----------------------|----------|----------------------------------------|
| Image                                      | Pearson Correlation | ,280**                | ,582**   | ,148                                   |
|                                            | Sig. (2-tailed)     | ,010                  | ,000     | ,181                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Visual Merchandising<br>Display Cues Scale | Pearson Correlation | ,688**                | ,842**   | ,059                                   |
|                                            | Sig. (2-tailed)     | ,000                  | ,000     | ,591                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Organization/Density                       | Pearson Correlation | ,154                  | ,408**   | ,005                                   |
|                                            | Sig. (2-tailed)     | ,163                  | ,000     | ,967                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Staging Techniques                         | Pearson Correlation | 1                     | ,416**   | ,069                                   |
|                                            | Sig. (2-tailed)     |                       | ,000     | ,530                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Lighting                                   | Pearson Correlation | ,416**                | 1        | ,058                                   |
|                                            | Sig. (2-tailed)     | ,000                  |          | ,602                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Impulse Buying Tendency<br>Scale           | Pearson Correlation | ,069                  | ,058     | 1                                      |
|                                            | Sig. (2-tailed)     | ,530                  | ,602     |                                        |
|                                            | N                   | 84                    | 84       | 84                                     |
| Cognitive States                           | Pearson Correlation | ,045                  | ,047     | ,872**                                 |
|                                            | Sig. (2-tailed)     | ,684                  | ,672     | ,000                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Affective States                           | Pearson Correlation | ,076                  | ,053     | ,864**                                 |
|                                            | Sig. (2-tailed)     | ,492                  | ,630     | ,000                                   |

|   |    |    |    |
|---|----|----|----|
| N | 84 | 84 | 84 |
|---|----|----|----|

#### Correlations

|                                         |                     | Cognitive States | Affective States |
|-----------------------------------------|---------------------|------------------|------------------|
| Image                                   | Pearson Correlation | ,138             | ,118             |
|                                         | Sig. (2-tailed)     | ,211             | ,285             |
|                                         | N                   | 84               | 84               |
| Visual Merchandising Display Cues Scale | Pearson Correlation | ,027             | ,076             |
|                                         | Sig. (2-tailed)     | ,804             | ,490             |
|                                         | N                   | 84               | 84               |
| Organization/Density                    | Pearson Correlation | -,034            | ,043             |
|                                         | Sig. (2-tailed)     | ,760             | ,699             |
|                                         | N                   | 84               | 84               |
| Staging Techniques                      | Pearson Correlation | ,045             | ,076             |
|                                         | Sig. (2-tailed)     | ,684             | ,492             |
|                                         | N                   | 84               | 84               |
| Lighting                                | Pearson Correlation | ,047             | ,053             |
|                                         | Sig. (2-tailed)     | ,672             | ,630             |
|                                         | N                   | 84               | 84               |
| Impulse Buying Tendency Scale           | Pearson Correlation | ,872**           | ,864**           |
|                                         | Sig. (2-tailed)     | ,000             | ,000             |
|                                         | N                   | 84               | 84               |
| Cognitive States                        | Pearson Correlation | 1                | ,506**           |
|                                         | Sig. (2-tailed)     |                  | ,000             |
|                                         | N                   | 84               | 84               |
| Affective States                        | Pearson Correlation | ,506**           | 1                |
|                                         | Sig. (2-tailed)     | ,000             |                  |
|                                         | N                   | 84               | 84               |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

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

## Nonparametric Correlations

a. Based on availability of workspace memory

### Correlations

|                   |                                               |                 | Image  | Visual<br>Merchandising<br>Display Cues<br>Scale | Organization/Densi<br>ty |
|-------------------|-----------------------------------------------|-----------------|--------|--------------------------------------------------|--------------------------|
| Spearman's<br>rho | Image                                         | Correlation     | 1,000  | ,506**                                           | ,254*                    |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | .      | ,000                                             | ,020                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Visual<br>Merchandising<br>Display Cues Scale | Correlation     | ,506** | 1,000                                            | ,664**                   |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,000   | .                                                | ,000                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Organization/Densit<br>y                      | Correlation     | ,254*  | ,664**                                           | 1,000                    |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,020   | ,000                                             | .                        |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Staging Techniques                            | Correlation     | ,282** | ,672**                                           | ,183                     |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,009   | ,000                                             | ,096                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Lighting                                      | Correlation     | ,575** | ,853**                                           | ,417**                   |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,000   | ,000                                             | ,000                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Impulse Buying<br>Tendency Scale              | Correlation     | ,171   | ,081                                             | -,011                    |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,119   | ,462                                             | ,920                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Cognitive States                              | Correlation     | ,168   | ,041                                             | -,040                    |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,127   | ,708                                             | ,717                     |
|                   |                                               | N               | 84     | 84                                               | 84                       |
|                   | Affective States                              | Correlation     | ,090   | ,107                                             | ,045                     |
|                   |                                               | Coefficient     |        |                                                  |                          |
|                   |                                               | Sig. (2-tailed) | ,413   | ,332                                             | ,683                     |

|  |   |    |    |    |
|--|---|----|----|----|
|  | N | 84 | 84 | 84 |
|--|---|----|----|----|

# *Correlations*

|                                            |       |                 | Staging<br>Techniques | Lighting | Impulse<br>Buying<br>Tendency<br>Scale |
|--------------------------------------------|-------|-----------------|-----------------------|----------|----------------------------------------|
| Spearman's rho                             | Image | Correlation     | ,282**                | ,575**   | ,171                                   |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,009                  | ,000     | ,119                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Visual Merchandising<br>Display Cues Scale |       | Correlation     | ,672**                | ,853**   | ,081                                   |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,000                  | ,000     | ,462                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Organization/Density                       |       | Correlation     | ,183                  | ,417**   | -,011                                  |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,096                  | ,000     | ,920                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Staging Techniques                         |       | Correlation     | 1,000                 | ,408**   | ,119                                   |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | .                     | ,000     | ,280                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Lighting                                   |       | Correlation     | ,408**                | 1,000    | ,114                                   |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,000                  | .        | ,304                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Impulse Buying<br>Tendency Scale           |       | Correlation     | ,119                  | ,114     | 1,000                                  |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,280                  | ,304     | .                                      |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Cognitive States                           |       | Correlation     | ,079                  | ,089     | ,865**                                 |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,474                  | ,422     | ,000                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |
| Affective States                           |       | Correlation     | ,142                  | ,085     | ,860**                                 |
|                                            |       | Coefficient     |                       |          |                                        |
|                                            |       | Sig. (2-tailed) | ,197                  | ,441     | ,000                                   |
|                                            |       | N               | 84                    | 84       | 84                                     |

*Correlations*

|                |                                         |                         | Cognitive States | Affective States |
|----------------|-----------------------------------------|-------------------------|------------------|------------------|
| Spearman's rho | Image                                   | Correlation Coefficient | ,168             | ,090             |
|                |                                         | Sig. (2-tailed)         | ,127             | ,413             |
|                |                                         | N                       | 84               | 84               |
|                | Visual Merchandising Display Cues Scale | Correlation Coefficient | ,041             | ,107             |
|                |                                         | Sig. (2-tailed)         | ,708             | ,332             |
|                |                                         | N                       | 84               | 84               |
|                | Organization/Density                    | Correlation Coefficient | -,040            | ,045             |
|                |                                         | Sig. (2-tailed)         | ,717             | ,683             |
|                |                                         | N                       | 84               | 84               |
|                | Staging Techniques                      | Correlation Coefficient | ,079             | ,142             |
|                |                                         | Sig. (2-tailed)         | ,474             | ,197             |
|                |                                         | N                       | 84               | 84               |
|                | Lighting                                | Correlation Coefficient | ,089             | ,085             |
|                |                                         | Sig. (2-tailed)         | ,422             | ,441             |
|                |                                         | N                       | 84               | 84               |
|                | Impulse Buying Tendency Scale           | Correlation Coefficient | ,865**           | ,860**           |
|                |                                         | Sig. (2-tailed)         | ,000             | ,000             |
|                |                                         | N                       | 84               | 84               |
|                | Cognitive States                        | Correlation Coefficient | 1,000            | ,512**           |
|                |                                         | Sig. (2-tailed)         | .                | ,000             |
|                |                                         | N                       | 84               | 84               |
|                | Affective States                        | Correlation Coefficient | ,512**           | 1,000            |
|                |                                         | Sig. (2-tailed)         | ,000             | .                |
|                |                                         | N                       | 84               | 84               |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

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

## Correlations

### Correlations

|                                            |                     | Visual<br>Merchandising<br>Display Cues<br>Scale | Organization/Density |
|--------------------------------------------|---------------------|--------------------------------------------------|----------------------|
| Visual Merchandising<br>Display Cues Scale | Pearson Correlation | 1                                                | ,694**               |
|                                            | Sig. (2-tailed)     |                                                  | ,000                 |
|                                            | N                   | 84                                               | 84                   |
| Organization/Density                       | Pearson Correlation | ,694**                                           | 1                    |
|                                            | Sig. (2-tailed)     | ,000                                             |                      |
|                                            | N                   | 84                                               | 84                   |
| Staging Techniques                         | Pearson Correlation | ,688**                                           | ,154                 |
|                                            | Sig. (2-tailed)     | ,000                                             | ,163                 |
|                                            | N                   | 84                                               | 84                   |
| Lighting                                   | Pearson Correlation | ,842**                                           | ,408**               |
|                                            | Sig. (2-tailed)     | ,000                                             | ,000                 |
|                                            | N                   | 84                                               | 84                   |
| Impulse Buying<br>Tendency Scale           | Pearson Correlation | ,059                                             | ,005                 |
|                                            | Sig. (2-tailed)     | ,591                                             | ,967                 |
|                                            | N                   | 84                                               | 84                   |
| Cognitive States                           | Pearson Correlation | ,027                                             | -,034                |
|                                            | Sig. (2-tailed)     | ,804                                             | ,760                 |
|                                            | N                   | 84                                               | 84                   |
| Affective States                           | Pearson Correlation | ,076                                             | ,043                 |
|                                            | Sig. (2-tailed)     | ,490                                             | ,699                 |
|                                            | N                   | 84                                               | 84                   |

*Correlations*

|                                            |                     | Staging<br>Techniques | Lighting | Impulse<br>Buying<br>Tendency<br>Scale |
|--------------------------------------------|---------------------|-----------------------|----------|----------------------------------------|
| Visual Merchandising<br>Display Cues Scale | Pearson Correlation | ,688**                | ,842**   | ,059                                   |
|                                            | Sig. (2-tailed)     | ,000                  | ,000     | ,591                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Organization/Density                       | Pearson Correlation | ,154                  | ,408**   | ,005                                   |
|                                            | Sig. (2-tailed)     | ,163                  | ,000     | ,967                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Staging Techniques                         | Pearson Correlation | 1                     | ,416**   | ,069                                   |
|                                            | Sig. (2-tailed)     |                       | ,000     | ,530                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Lighting                                   | Pearson Correlation | ,416**                | 1        | ,058                                   |
|                                            | Sig. (2-tailed)     | ,000                  |          | ,602                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Impulse Buying Tendency<br>Scale           | Pearson Correlation | ,069                  | ,058     | 1                                      |
|                                            | Sig. (2-tailed)     | ,530                  | ,602     |                                        |
|                                            | N                   | 84                    | 84       | 84                                     |
| Cognitive States                           | Pearson Correlation | ,045                  | ,047     | ,872**                                 |
|                                            | Sig. (2-tailed)     | ,684                  | ,672     | ,000                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Affective States                           | Pearson Correlation | ,076                  | ,053     | ,864**                                 |
|                                            | Sig. (2-tailed)     | ,492                  | ,630     | ,000                                   |
|                                            | N                   | 84                    | 84       | 84                                     |

*Correlations*

|                                            |                     | Cognitive States | Affective States |
|--------------------------------------------|---------------------|------------------|------------------|
| Visual Merchandising Display<br>Cues Scale | Pearson Correlation | ,027             | ,076             |
|                                            | Sig. (2-tailed)     | ,804             | ,490             |
|                                            | N                   | 84               | 84               |

|                               |                     |        |        |
|-------------------------------|---------------------|--------|--------|
| Organization/Density          | Pearson Correlation | -,034  | ,043   |
|                               | Sig. (2-tailed)     | ,760   | ,699   |
|                               | N                   | 84     | 84     |
| Staging Techniques            | Pearson Correlation | ,045   | ,076   |
|                               | Sig. (2-tailed)     | ,684   | ,492   |
|                               | N                   | 84     | 84     |
| Lighting                      | Pearson Correlation | ,047   | ,053   |
|                               | Sig. (2-tailed)     | ,672   | ,630   |
|                               | N                   | 84     | 84     |
| Impulse Buying Tendency Scale | Pearson Correlation | ,872** | ,864** |
|                               | Sig. (2-tailed)     | ,000   | ,000   |
|                               | N                   | 84     | 84     |
| Cognitive States              | Pearson Correlation | 1      | ,506** |
|                               | Sig. (2-tailed)     |        | ,000   |
|                               | N                   | 84     | 84     |
| Affective States              | Pearson Correlation | ,506** | 1      |
|                               | Sig. (2-tailed)     | ,000   |        |
|                               | N                   | 84     | 84     |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### Nonparametric Correlations

#### Correlations

|                |                                         | Visual Merchandising Display Cues Scale | Organization/Density |
|----------------|-----------------------------------------|-----------------------------------------|----------------------|
| Spearman's rho | Visual Merchandising Display Cues Scale | Correlation                             | 1,000                |
|                |                                         | Coefficient                             | ,664**               |
|                |                                         | Sig. (2-tailed)                         | ,000                 |
|                |                                         | N                                       | 84                   |
|                | Organization/Density                    | Correlation                             | ,664**               |
|                |                                         | Coefficient                             | 1,000                |
|                |                                         | Sig. (2-tailed)                         | ,000                 |
|                |                                         | N                                       | 84                   |

|                                  |                         |        |        |
|----------------------------------|-------------------------|--------|--------|
| Staging Techniques               | Correlation Coefficient | ,672** | ,183   |
|                                  | Sig. (2-tailed)         | ,000   | ,096   |
|                                  | N                       | 84     | 84     |
|                                  |                         |        |        |
| Lighting                         | Correlation Coefficient | ,853** | ,417** |
|                                  | Sig. (2-tailed)         | ,000   | ,000   |
|                                  | N                       | 84     | 84     |
|                                  |                         |        |        |
| Impulse Buying<br>Tendency Scale | Correlation Coefficient | ,081   | -,011  |
|                                  | Sig. (2-tailed)         | ,462   | ,920   |
|                                  | N                       | 84     | 84     |
|                                  |                         |        |        |
| Cognitive States                 | Correlation Coefficient | ,041   | -,040  |
|                                  | Sig. (2-tailed)         | ,708   | ,717   |
|                                  | N                       | 84     | 84     |
|                                  |                         |        |        |
| Affective States                 | Correlation Coefficient | ,107   | ,045   |
|                                  | Sig. (2-tailed)         | ,332   | ,683   |
|                                  | N                       | 84     | 84     |
|                                  |                         |        |        |

#### Correlations

|                |                                            |                         | Staging<br>Techniques | Lighting |
|----------------|--------------------------------------------|-------------------------|-----------------------|----------|
| Spearman's rho | Visual Merchandising<br>Display Cues Scale | Correlation Coefficient | ,672**                | ,853**   |
|                |                                            | Sig. (2-tailed)         | ,000                  | ,000     |
|                |                                            | N                       | 84                    | 84       |
|                | Organization/Density                       | Correlation Coefficient | ,183                  | ,417**   |
|                |                                            | Sig. (2-tailed)         | ,096                  | ,000     |
|                |                                            | N                       | 84                    | 84       |
|                | Staging Techniques                         | Correlation Coefficient | 1,000                 | ,408**   |
|                |                                            | Sig. (2-tailed)         | .                     | ,000     |
|                |                                            | N                       | 84                    | 84       |
|                | Lighting                                   | Correlation Coefficient | ,408**                | 1,000    |
|                |                                            | Sig. (2-tailed)         | ,000                  | .        |
|                |                                            | N                       | 84                    | 84       |
|                | Impulse Buying<br>Tendency Scale           | Correlation Coefficient | ,119                  | ,114     |
|                |                                            | Sig. (2-tailed)         | ,280                  | ,304     |

|                  |                         |      |      |
|------------------|-------------------------|------|------|
|                  | N                       | 84   | 84   |
| Cognitive States | Correlation Coefficient | ,079 | ,089 |
|                  | Sig. (2-tailed)         | ,474 | ,422 |
|                  | N                       | 84   | 84   |
| Affective States | Correlation Coefficient | ,142 | ,085 |
|                  | Sig. (2-tailed)         | ,197 | ,441 |
|                  | N                       | 84   | 84   |

#### Correlations

|                  |                                            |                         | Impulse<br>Buying<br>Tendency<br>Scale | Cognitive<br>States |
|------------------|--------------------------------------------|-------------------------|----------------------------------------|---------------------|
| Spearman's rho   | Visual Merchandising<br>Display Cues Scale | Correlation Coefficient | ,081                                   | ,041                |
|                  |                                            | Sig. (2-tailed)         | ,462                                   | ,708                |
|                  |                                            | N                       | 84                                     | 84                  |
|                  | Organization/Density                       | Correlation Coefficient | -,011                                  | -,040               |
|                  |                                            | Sig. (2-tailed)         | ,920                                   | ,717                |
|                  |                                            | N                       | 84                                     | 84                  |
|                  | Staging Techniques                         | Correlation Coefficient | ,119                                   | ,079                |
|                  |                                            | Sig. (2-tailed)         | ,280                                   | ,474                |
|                  |                                            | N                       | 84                                     | 84                  |
|                  | Lighting                                   | Correlation Coefficient | ,114                                   | ,089                |
|                  |                                            | Sig. (2-tailed)         | ,304                                   | ,422                |
|                  |                                            | N                       | 84                                     | 84                  |
|                  | Impulse Buying<br>Tendency Scale           | Correlation Coefficient | 1,000                                  | ,865**              |
|                  |                                            | Sig. (2-tailed)         | .                                      | ,000                |
|                  |                                            | N                       | 84                                     | 84                  |
|                  | Cognitive States                           | Correlation Coefficient | ,865**                                 | 1,000               |
|                  |                                            | Sig. (2-tailed)         | ,000                                   | .                   |
|                  |                                            | N                       | 84                                     | 84                  |
| Affective States | Correlation Coefficient                    | ,860**                  | ,512**                                 |                     |
|                  | Sig. (2-tailed)                            | ,000                    | ,000                                   |                     |
|                  | N                                          | 84                      | 84                                     |                     |

#### Correlations

|  |                  |
|--|------------------|
|  | Affective States |
|--|------------------|

|                |                                         |                         |        |
|----------------|-----------------------------------------|-------------------------|--------|
| Spearman's rho | Visual Merchandising Display Cues Scale | Correlation Coefficient | ,107   |
|                |                                         | Sig. (2-tailed)         | ,332   |
|                |                                         | N                       | 84     |
|                | Organization/Density                    | Correlation Coefficient | ,045   |
|                |                                         | Sig. (2-tailed)         | ,683   |
|                |                                         | N                       | 84     |
|                | Staging Techniques                      | Correlation Coefficient | ,142   |
|                |                                         | Sig. (2-tailed)         | ,197   |
|                |                                         | N                       | 84     |
|                | Lighting                                | Correlation Coefficient | ,085   |
|                |                                         | Sig. (2-tailed)         | ,441   |
|                |                                         | N                       | 84     |
|                | Impulse Buying Tendency Scale           | Correlation Coefficient | ,860** |
|                |                                         | Sig. (2-tailed)         | ,000   |
|                |                                         | N                       | 84     |
|                | Cognitive States                        | Correlation Coefficient | ,512** |
|                |                                         | Sig. (2-tailed)         | ,000   |
|                |                                         | N                       | 84     |
|                | Affective States                        | Correlation Coefficient | 1,000  |
|                |                                         | Sig. (2-tailed)         | .      |
|                |                                         | N                       | 84     |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Correlations

### Correlations

|                                         |                     | Visual Merchandising Display Cues Scale | Organization/Density |
|-----------------------------------------|---------------------|-----------------------------------------|----------------------|
| Visual Merchandising Display Cues Scale | Pearson Correlation | 1                                       | ,694**               |
|                                         | Sig. (2-tailed)     |                                         | ,000                 |
|                                         | N                   | 84                                      | 84                   |
| Organization/Density                    | Pearson Correlation | ,694**                                  | 1                    |
|                                         | Sig. (2-tailed)     | ,000                                    |                      |
|                                         | N                   | 84                                      | 84                   |

|                                  |                     |        |        |
|----------------------------------|---------------------|--------|--------|
| Staging Techniques               | Pearson Correlation | ,688** | ,154   |
|                                  | Sig. (2-tailed)     | ,000   | ,163   |
|                                  | N                   | 84     | 84     |
| Lighting                         | Pearson Correlation | ,842** | ,408** |
|                                  | Sig. (2-tailed)     | ,000   | ,000   |
|                                  | N                   | 84     | 84     |
| Impulse Buying<br>Tendency Scale | Pearson Correlation | ,059   | ,005   |
|                                  | Sig. (2-tailed)     | ,591   | ,967   |
|                                  | N                   | 84     | 84     |
| Cognitive States                 | Pearson Correlation | ,027   | -,034  |
|                                  | Sig. (2-tailed)     | ,804   | ,760   |
|                                  | N                   | 84     | 84     |
| Affective States                 | Pearson Correlation | ,076   | ,043   |
|                                  | Sig. (2-tailed)     | ,490   | ,699   |
|                                  | N                   | 84     | 84     |

#### Correlations

|                                            |                     | Staging<br>Techniques | Lighting | Impulse<br>Buying<br>Tendency<br>Scale |
|--------------------------------------------|---------------------|-----------------------|----------|----------------------------------------|
| Visual Merchandising<br>Display Cues Scale | Pearson Correlation | ,688**                | ,842**   | ,059                                   |
|                                            | Sig. (2-tailed)     | ,000                  | ,000     | ,591                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Organization/Density                       | Pearson Correlation | ,154                  | ,408**   | ,005                                   |
|                                            | Sig. (2-tailed)     | ,163                  | ,000     | ,967                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Staging Techniques                         | Pearson Correlation | 1                     | ,416**   | ,069                                   |
|                                            | Sig. (2-tailed)     |                       | ,000     | ,530                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Lighting                                   | Pearson Correlation | ,416**                | 1        | ,058                                   |
|                                            | Sig. (2-tailed)     | ,000                  |          | ,602                                   |
|                                            | N                   | 84                    | 84       | 84                                     |
| Impulse Buying Tendency<br>Scale           | Pearson Correlation | ,069                  | ,058     | 1                                      |
|                                            | Sig. (2-tailed)     | ,530                  | ,602     |                                        |

|                  |                     |      |      |        |
|------------------|---------------------|------|------|--------|
|                  | N                   | 84   | 84   | 84     |
| Cognitive States | Pearson Correlation | ,045 | ,047 | ,872** |
|                  | Sig. (2-tailed)     | ,684 | ,672 | ,000   |
|                  | N                   | 84   | 84   | 84     |
| Affective States | Pearson Correlation | ,076 | ,053 | ,864** |
|                  | Sig. (2-tailed)     | ,492 | ,630 | ,000   |
|                  | N                   | 84   | 84   | 84     |

#### *Correlations*

|                                         |                     | Cognitive States | Affective States |
|-----------------------------------------|---------------------|------------------|------------------|
| Visual Merchandising Display Cues Scale | Pearson Correlation | ,027             | ,076             |
|                                         | Sig. (2-tailed)     | ,804             | ,490             |
|                                         | N                   | 84               | 84               |
| Organization/Density                    | Pearson Correlation | -,034            | ,043             |
|                                         | Sig. (2-tailed)     | ,760             | ,699             |
|                                         | N                   | 84               | 84               |
| Staging Techniques                      | Pearson Correlation | ,045             | ,076             |
|                                         | Sig. (2-tailed)     | ,684             | ,492             |
|                                         | N                   | 84               | 84               |
| Lighting                                | Pearson Correlation | ,047             | ,053             |
|                                         | Sig. (2-tailed)     | ,672             | ,630             |
|                                         | N                   | 84               | 84               |
| Impulse Buying Tendency Scale           | Pearson Correlation | ,872**           | ,864**           |
|                                         | Sig. (2-tailed)     | ,000             | ,000             |
|                                         | N                   | 84               | 84               |
| Cognitive States                        | Pearson Correlation | 1                | ,506**           |
|                                         | Sig. (2-tailed)     |                  | ,000             |
|                                         | N                   | 84               | 84               |
| Affective States                        | Pearson Correlation | ,506**           | 1                |
|                                         | Sig. (2-tailed)     | ,000             |                  |
|                                         | N                   | 84               | 84               |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Correlations

### Correlations

|       |     |                 |           | Visual<br>Merchandis<br>ing Display<br>Cues Scale | Organization/De<br>nsity | Staging<br>Techniqu<br>es | Lighti<br>ng | Impuls<br>e<br>Buying<br>Tenden<br>cy<br>Scale | Cogniti<br>ve<br>States |
|-------|-----|-----------------|-----------|---------------------------------------------------|--------------------------|---------------------------|--------------|------------------------------------------------|-------------------------|
| Image | Low | Visual          | Pearson   | 1                                                 | ,605**                   | ,638**                    | ,746**       | -,013                                          | -,072                   |
|       | Ima | Merchandising   | Correlati |                                                   |                          |                           |              |                                                |                         |
|       | ge  | Display Cues    | on        |                                                   |                          |                           |              |                                                |                         |
|       |     | Scale           | Sig.      |                                                   | ,000                     | ,000                      | ,000         | ,934                                           | ,649                    |
|       |     |                 | (2-tailed |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | )         |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | N         | 42                                                | 42                       | 42                        | 42           | 42                                             | 42                      |
|       |     |                 |           |                                                   |                          |                           |              |                                                |                         |
|       |     | Organization/De | Pearson   | ,605**                                            | 1                        | ,014                      | ,183         | ,000                                           | -,082                   |
|       |     | nsity           | Correlati |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | on        |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | Sig.      | ,000                                              |                          | ,928                      | ,246         | 1,000                                          | ,607                    |
|       |     |                 | (2-tailed |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | )         |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | N         | 42                                                | 42                       | 42                        | 42           | 42                                             | 42                      |
|       |     |                 |           |                                                   |                          |                           |              |                                                |                         |
|       |     | Staging         | Pearson   | ,638**                                            | ,014                     | 1                         | ,282         | ,031                                           | ,036                    |
|       |     | Techniques      | Correlati |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | on        |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | Sig.      | ,000                                              | ,928                     |                           | ,070         | ,843                                           | ,822                    |
|       |     |                 | (2-tailed |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | )         |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | N         | 42                                                | 42                       | 42                        | 42           | 42                                             | 42                      |
|       |     |                 |           |                                                   |                          |                           |              |                                                |                         |
|       |     | Lighting        | Pearson   | ,746**                                            | ,183                     | ,282                      | 1            | -,055                                          | -,094                   |
|       |     |                 | Correlati |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | on        |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | Sig.      | ,000                                              | ,246                     | ,070                      |              | ,730                                           | ,555                    |
|       |     |                 | (2-tailed |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | )         |                                                   |                          |                           |              |                                                |                         |
|       |     |                 | N         | 42                                                | 42                       | 42                        | 42           | 42                                             | 42                      |

|                                                             |                        |        |        |        |        |        |        |
|-------------------------------------------------------------|------------------------|--------|--------|--------|--------|--------|--------|
| Impulse Buying<br>Tendency Scale                            | Pearson                | -,013  | ,000   | ,031   | -,055  | 1      | ,906** |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) | ,934   | 1,000  | ,843   | ,730   |        | ,000   |
|                                                             | N                      | 42     | 42     | 42     | 42     | 42     | 42     |
| Cognitive States                                            | Pearson                | -,072  | -,082  | ,036   | -,094  | ,906** | 1      |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) | ,649   | ,607   | ,822   | ,555   | ,000   |        |
|                                                             | N                      | 42     | 42     | 42     | 42     | 42     | 42     |
| Affective States                                            | Pearson                | ,052   | ,087   | ,020   | -,002  | ,893** | ,617** |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) | ,742   | ,585   | ,898   | ,989   | ,000   | ,000   |
|                                                             | N                      | 42     | 42     | 42     | 42     | 42     | 42     |
| High Visual<br>Image Merchandising<br>Display Cues<br>Scale | Pearson                | 1      | ,767** | ,684** | ,832** | -,026  | -,022  |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) |        | ,000   | ,000   | ,000   | ,872   | ,889   |
|                                                             | N                      | 42     | 42     | 42     | 42     | 42     | 42     |
| Organization/Den<br>sity                                    | Pearson                | ,767** | 1      | ,181   | ,548** | -,080  | -,054  |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) | ,000   |        | ,251   | ,000   | ,613   | ,734   |
|                                                             | N                      | 42     | 42     | 42     | 42     | 42     | 42     |
| Staging<br>Techniques                                       | Pearson                | ,684** | ,181   | 1      | ,380*  | ,027   | -,033  |
|                                                             | Correlati<br>on        |        |        |        |        |        |        |
|                                                             | Sig.<br>(2-tailed<br>) | ,000   | ,251   |        | ,013   | ,863   | ,834   |
|                                                             | N                      |        |        |        |        |        |        |

|                                  |                        |        |        |       |       |        |        |
|----------------------------------|------------------------|--------|--------|-------|-------|--------|--------|
|                                  | N                      | 42     | 42     | 42    | 42    | 42     | 42     |
| Lighting                         | Pearson                | ,832** | ,548** | ,380* | 1     | -,001  | ,043   |
|                                  | Correlati<br>on        |        |        |       |       |        |        |
|                                  | Sig.<br>(2-tailed<br>) | ,000   | ,000   | ,013  |       | ,993   | ,789   |
|                                  | N                      | 42     | 42     | 42    | 42    | 42     | 42     |
| Impulse Buying<br>Tendency Scale | Pearson                | -,026  | -,080  | ,027  | -,001 | 1      | ,805** |
|                                  | Correlati<br>on        |        |        |       |       |        |        |
|                                  | Sig.<br>(2-tailed<br>) | ,872   | ,613   | ,863  | ,993  |        | ,000   |
|                                  | N                      | 42     | 42     | 42    | 42    | 42     | 42     |
| Cognitive States                 | Pearson                | -,022  | -,054  | -,033 | ,043  | ,805** | 1      |
|                                  | Correlati<br>on        |        |        |       |       |        |        |
|                                  | Sig.<br>(2-tailed<br>) | ,889   | ,734   | ,834  | ,789  | ,000   |        |
|                                  | N                      | 42     | 42     | 42    | 42    | 42     | 42     |
| Affective States                 | Pearson                | -,019  | -,076  | ,076  | -,044 | ,817** | ,316*  |
|                                  | Correlati<br>on        |        |        |       |       |        |        |
|                                  | Sig.<br>(2-tailed<br>) | ,904   | ,632   | ,631  | ,784  | ,000   | ,042   |
|                                  | N                      | 42     | 42     | 42    | 42    | 42     | 42     |

#### Correlations

| Image     |                                         | Affective States                                         |
|-----------|-----------------------------------------|----------------------------------------------------------|
| Low Image | Visual Merchandising Display Cues Scale | Pearson Correlation ,052<br>Sig. (2-tailed) ,742<br>N 42 |
|           | Organization/Density                    | Pearson Correlation ,087<br>Sig. (2-tailed) ,585<br>N 42 |
|           | Staging Techniques                      | Pearson Correlation ,020<br>Sig. (2-tailed) ,898         |

|            |                                         |                     |        |
|------------|-----------------------------------------|---------------------|--------|
|            |                                         | N                   | 42     |
|            | Lighting                                | Pearson Correlation | -,002  |
|            |                                         | Sig. (2-tailed)     | ,989   |
|            |                                         | N                   | 42     |
|            | Impulse Buying Tendency Scale           | Pearson Correlation | ,893** |
|            |                                         | Sig. (2-tailed)     | ,000   |
|            |                                         | N                   | 42     |
|            | Cognitive States                        | Pearson Correlation | ,617** |
|            |                                         | Sig. (2-tailed)     | ,000   |
|            |                                         | N                   | 42     |
|            | Affective States                        | Pearson Correlation | 1      |
|            |                                         | Sig. (2-tailed)     |        |
|            |                                         | N                   | 42     |
| High Image | Visual Merchandising Display Cues Scale | Pearson Correlation | -,019  |
|            |                                         | Sig. (2-tailed)     | ,904   |
|            |                                         | N                   | 42     |
|            | Organization/Density                    | Pearson Correlation | -,076  |
|            |                                         | Sig. (2-tailed)     | ,632   |
|            |                                         | N                   | 42     |
|            | Staging Techniques                      | Pearson Correlation | ,076   |
|            |                                         | Sig. (2-tailed)     | ,631   |
|            |                                         | N                   | 42     |
|            | Lighting                                | Pearson Correlation | -,044  |
|            |                                         | Sig. (2-tailed)     | ,784   |
|            |                                         | N                   | 42     |
|            | Impulse Buying Tendency Scale           | Pearson Correlation | ,817** |
|            |                                         | Sig. (2-tailed)     | ,000   |
|            |                                         | N                   | 42     |
|            | Cognitive States                        | Pearson Correlation | ,316*  |
|            |                                         | Sig. (2-tailed)     | ,042   |
|            |                                         | N                   | 42     |
|            | Affective States                        | Pearson Correlation | 1      |
|            |                                         | Sig. (2-tailed)     |        |
|            |                                         | N                   | 42     |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

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

## APPENDIX O. Independent Samples T-Test

Custom Tables

|                                         | Image     |                    |            |                    |
|-----------------------------------------|-----------|--------------------|------------|--------------------|
|                                         | Low Image |                    | High Image |                    |
|                                         | Mean      | Standard Deviation | Mean       | Standard Deviation |
| Visual Merchandising Display Cues Scale | 3,30      | 1,02               | 4,51       | 1,05               |
| Organization/Density                    | 2,74      | 1,55               | 3,48       | 1,45               |
| Staging Techniques                      | 4,21      | 1,49               | 5,05       | 1,40               |
| Lighting                                | 2,95      | 1,59               | 5,00       | 1,29               |

### T-Test

Group Statistics

|                      | Image      | N  | Mean   | Std. Deviation | Std. Error Mean |
|----------------------|------------|----|--------|----------------|-----------------|
| Visual Merchandising | Low Image  | 42 | 3,3016 | 1,02492        | ,15815          |
| Display Cues Scale   | High Image | 42 | 4,5079 | 1,04697        | ,16155          |
| Organization/Density | Low Image  | 42 | 2,7381 | 1,54698        | ,23870          |
|                      | High Image | 42 | 3,4762 | 1,45230        | ,22409          |
| Staging Techniques   | Low Image  | 42 | 4,2143 | 1,49039        | ,22997          |
|                      | High Image | 42 | 5,0476 | 1,39603        | ,21541          |
| Lighting             | Low Image  | 42 | 2,9524 | 1,59194        | ,24564          |
|                      | High Image | 42 | 5,0000 | 1,28784        | ,19872          |

Independent Samples Test

|                      |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |
|----------------------|-----------------------------|-----------------------------------------|------|------------------------------|
|                      |                             | F                                       | Sig. | t                            |
| Visual Merchandising | Equal variances assumed     | ,850                                    | ,359 | -5,336                       |
| Display Cues Scale   | Equal variances not assumed |                                         |      | -5,336                       |
| Organization/Density | Equal variances assumed     | ,022                                    | ,883 | -2,254                       |
|                      | Equal variances not assumed |                                         |      | -2,254                       |
| Staging Techniques   | Equal variances assumed     | 1,295                                   | ,258 | -2,645                       |
|                      | Equal variances not assumed |                                         |      | -2,645                       |
| Lighting             | Equal variances assumed     | 1,899                                   | ,172 | -6,481                       |
|                      | Equal variances not assumed |                                         |      | -6,481                       |

Independent Samples Test

|                      |                             | t-test for Equality of Means |                 |                 |
|----------------------|-----------------------------|------------------------------|-----------------|-----------------|
|                      |                             | df                           | Sig. (2-tailed) | Mean Difference |
| Visual Merchandising | Equal variances assumed     | 82                           | ,000            | -1,20635        |
| Display Cues Scale   | Equal variances not assumed | 81,963                       | ,000            | -1,20635        |
| Organization/Density | Equal variances assumed     | 82                           | ,027            | -,73810         |

|                    |                             |        |      |          |
|--------------------|-----------------------------|--------|------|----------|
|                    | Equal variances not assumed | 81,675 | ,027 | -,73810  |
| Staging Techniques | Equal variances assumed     | 82     | ,010 | -,83333  |
|                    | Equal variances not assumed | 81,652 | ,010 | -,83333  |
| Lighting           | Equal variances assumed     | 82     | ,000 | -2,04762 |
|                    | Equal variances not assumed | 78,572 | ,000 | -2,04762 |

*Independent Samples Test*

|                                         |                             | t-test for Equality of Means |                                           |
|-----------------------------------------|-----------------------------|------------------------------|-------------------------------------------|
|                                         |                             | Std. Error Difference        | 95% Confidence Interval of the Difference |
|                                         |                             |                              | Lower                                     |
| Visual Merchandising Display Cues Scale | Equal variances assumed     | ,22607                       | -1,65608                                  |
|                                         | Equal variances not assumed | ,22607                       | -1,65609                                  |
| Organization/Density                    | Equal variances assumed     | ,32741                       | -1,38942                                  |
|                                         | Equal variances not assumed | ,32741                       | -1,38946                                  |
| Staging Techniques                      | Equal variances assumed     | ,31510                       | -1,46017                                  |
|                                         | Equal variances not assumed | ,31510                       | -1,46021                                  |
| Lighting                                | Equal variances assumed     | ,31596                       | -2,67616                                  |
|                                         | Equal variances not assumed | ,31596                       | -2,67657                                  |

| t-test for Equality of Means              |
|-------------------------------------------|
| 95% Confidence Interval of the Difference |
| Upper                                     |
| -,75662                                   |
| -,75661                                   |
| -,08677                                   |
| -,08673                                   |
| -,20649                                   |
| -,20645                                   |
| -1,41908                                  |
| -1,41867                                  |

|                                         | Image     |                    |            |                    |
|-----------------------------------------|-----------|--------------------|------------|--------------------|
|                                         | Low Image |                    | High Image |                    |
|                                         | Mean      | Standard Deviation | Mean       | Standard Deviation |
| Visual Merchandising Display Cues Scale | 3,30      | 1,02               | 4,51       | 1,05               |
| Organization/Density                    | 2,74      | 1,55               | 3,48       | 1,45               |
| Staging Techniques                      | 4,21      | 1,49               | 5,05       | 1,40               |
| Lighting                                | 2,95      | 1,59               | 5,00       | 1,29               |
| Impulse Buying Tendency Scale           | 3,77      | 1,01               | 4,03       | ,73                |
| Cognitive States                        | 3,56      | 1,16               | 3,85       | ,89                |
| Affective States                        | 3,97      | 1,09               | 4,21       | ,91                |

## T-Test

### Group Statistics

|                               | Image      | N  | Mean   | Std. Deviation | Std. Error Mean |
|-------------------------------|------------|----|--------|----------------|-----------------|
| Impulse Buying Tendency Scale | Low Image  | 42 | 3,7679 | 1,00855        | ,15562          |
|                               | High Image | 42 | 4,0274 | ,73045         | ,11271          |
| Cognitive States              | Low Image  | 42 | 3,5643 | 1,15586        | ,17835          |
|                               | High Image | 42 | 3,8476 | ,88792         | ,13701          |
| Affective States              | Low Image  | 42 | 3,9714 | 1,08724        | ,16776          |
|                               | High Image | 42 | 4,2071 | ,91315         | ,14090          |

### Independent Samples Test

|                               |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |
|-------------------------------|-----------------------------|-----------------------------------------|------|------------------------------|
|                               |                             | F                                       | Sig. | t                            |
| Impulse Buying Tendency Scale | Equal variances assumed     | 3,471                                   | ,066 | -1,351                       |
|                               | Equal variances not assumed |                                         |      | -1,351                       |
| Cognitive States              | Equal variances assumed     | 2,647                                   | ,108 | -1,260                       |
|                               | Equal variances not assumed |                                         |      | -1,260                       |
| Affective States              | Equal variances assumed     | 1,151                                   | ,286 | -1,076                       |
|                               | Equal variances not assumed |                                         |      | -1,076                       |

### Independent Samples Test

|                               |                             | t-test for Equality of Means |                 |                 |
|-------------------------------|-----------------------------|------------------------------|-----------------|-----------------|
|                               |                             | df                           | Sig. (2-tailed) | Mean Difference |
| Impulse Buying Tendency Scale | Equal variances assumed     | 82                           | ,181            | -,25952         |
|                               | Equal variances not assumed | 74,732                       | ,181            | -,25952         |
| Cognitive States              | Equal variances assumed     | 82                           | ,211            | -,28333         |
|                               | Equal variances not assumed | 76,891                       | ,212            | -,28333         |
| Affective States              | Equal variances assumed     | 82                           | ,285            | -,23571         |
|                               | Equal variances not assumed | 79,624                       | ,285            | -,23571         |

### Independent Samples Test

|                               |                             | t-test for Equality of Means |                                                    |
|-------------------------------|-----------------------------|------------------------------|----------------------------------------------------|
|                               |                             | Std. Error Difference        | 95% Confidence Interval of the Difference<br>Lower |
| Impulse Buying Tendency Scale | Equal variances assumed     | ,19215                       | -,64177                                            |
|                               | Equal variances not assumed | ,19215                       | -,64233                                            |
| Cognitive States              | Equal variances assumed     | ,22490                       | -,73074                                            |
|                               | Equal variances not assumed | ,22490                       | -,73118                                            |
| Affective States              | Equal variances assumed     | ,21909                       | -,67155                                            |
|                               | Equal variances not assumed | ,21909                       | -,67174                                            |

# Independent Samples Test

|                               |                             | t-test for Equality of Means              |
|-------------------------------|-----------------------------|-------------------------------------------|
|                               |                             | 95% Confidence Interval of the Difference |
|                               |                             | Upper                                     |
| Impulse Buying Tendency Scale | Equal variances assumed     | ,12273                                    |
|                               | Equal variances not assumed | ,12328                                    |
| Cognitive States              | Equal variances assumed     | ,16407                                    |
|                               | Equal variances not assumed | ,16452                                    |
| Affective States              | Equal variances assumed     | ,20012                                    |
|                               | Equal variances not assumed | ,20031                                    |

## APPENDIX P. Two-way unrelated ANOVA

### Univariate Analysis of Variance

#### Between-Subjects Factors

|          | Value | Label              | N   |
|----------|-------|--------------------|-----|
| Image    | ,00   | Low Image          | 126 |
|          | 1,00  | High Image         | 126 |
| variable | 1,00  | organisation       | 84  |
|          | 2,00  | staging techniques | 84  |
|          | 3,00  | lighting           | 84  |

#### Descriptive Statistics

Dependent Variable: IBB

| Image      | variable           | Mean   | Std. Deviation | N   |
|------------|--------------------|--------|----------------|-----|
| Low Image  | organisation       | 2,7381 | 1,54698        | 42  |
|            | staging techniques | 4,2143 | 1,49039        | 42  |
|            | lighting           | 2,9524 | 1,59194        | 42  |
|            | Total              | 3,3016 | 1,66503        | 126 |
|            |                    |        |                |     |
| High Image | organisation       | 3,4762 | 1,45230        | 42  |
|            | sahneleme          | 5,0476 | 1,39603        | 42  |
|            | lighting           | 5,0000 | 1,28784        | 42  |
|            | Total              | 4,5079 | 1,55304        | 126 |
| Total      | organisation       | 3,1071 | 1,53684        | 84  |
|            | sahneleme          | 4,6310 | 1,49521        | 84  |
|            | lighting           | 3,9762 | 1,76973        | 84  |
|            | Total              | 3,9048 | 1,71670        | 252 |

#### Levene's Test of Equality of Error Variances<sup>a,b</sup>

|     | Levene Statistic                     | df1  | df2 | Sig.    |
|-----|--------------------------------------|------|-----|---------|
| IBB | Based on Mean                        | ,854 | 5   | 246     |
|     | Based on Median                      | ,600 | 5   | 246     |
|     | Based on Median and with adjusted df | ,600 | 5   | 220,980 |
|     | Based on trimmed mean                | ,827 | 5   | 246     |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: IBB

b. Design: Intercept + imajgrubu + variable + imajgrubu \* variable

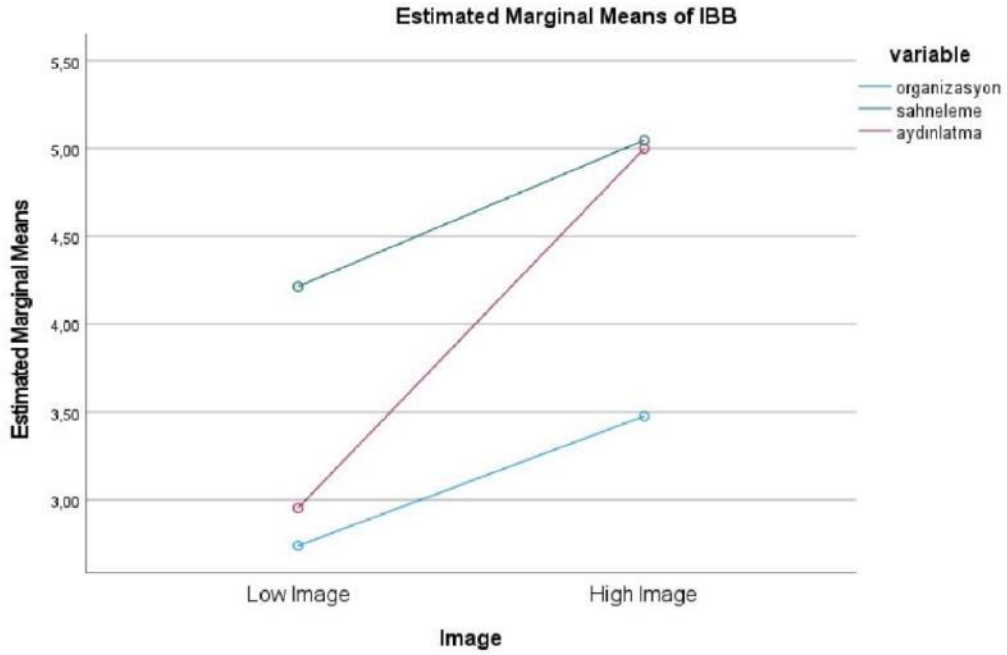
### Tests of Between-Subjects Effects

Dependent Variable: IBB

| Source           | Type III Sum of Squares | df  | Mean Square | F        | Sig. | Partial Eta Squared |
|------------------|-------------------------|-----|-------------|----------|------|---------------------|
| Corrected Model  | 212,238 <sup>a</sup>    | 5   | 42,448      | 19,796   | ,000 | ,287                |
| Intercept        | 3842,286                | 1   | 3842,286    | 1791,934 | ,000 | ,879                |
| image            | 91,683                  | 1   | 91,683      | 42,758   | ,000 | ,148                |
| variable         | 98,167                  | 2   | 49,083      | 22,891   | ,000 | ,157                |
| image * variable | 22,389                  | 2   | 11,194      | 5,221    | ,006 | ,041                |
| Error            | 527,476                 | 246 | 2,144       |          |      |                     |
| Total            | 4582,000                | 252 |             |          |      |                     |
| Corrected Total  | 739,714                 | 251 |             |          |      |                     |

a. R Squared = ,287 (Adjusted R Squared = ,272)

### Profile Plots



## APPENDIX Q. Linear Regression Analysis

| Coefficients <sup>a</sup> |                                             |                             |            |                           |        |      |                                 |             |
|---------------------------|---------------------------------------------|-----------------------------|------------|---------------------------|--------|------|---------------------------------|-------------|
| Model                     |                                             | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. | 95,0% Confidence Interval for B |             |
|                           |                                             | B                           | Std. Error | Beta                      |        |      | Lower Bound                     | Upper Bound |
| 1                         | (Constant)                                  | 2,325                       | 15,586     |                           | ,149   | ,882 | -28,785                         | 33,434      |
|                           | Image                                       | 3,708                       | ,825       | ,520                      | 4,493  | ,000 | 2,061                           | 5,355       |
|                           | Age                                         | -,380                       | ,237       | -,299                     | -1,602 | ,114 | -,853                           | ,094        |
|                           | Gender                                      | ,792                        | 1,157      | ,072                      | ,684   | ,496 | -1,518                          | 3,102       |
|                           | Education Level                             | 2,301                       | 1,907      | ,218                      | 1,206  | ,232 | -1,506                          | 6,107       |
|                           | Mojo                                        | ,368                        | ,364       | ,133                      | 1,012  | ,315 | -,358                           | 1,095       |
|                           | Shopping Frequency                          | -,067                       | ,460       | -,018                     | -,146  | ,884 | -,984                           | ,850        |
|                           | Monthly Income                              | ,377                        | ,516       | ,093                      | ,730   | ,468 | -,654                           | 1,407       |
|                           | Frequency of Computer Use                   | ,492                        | ,644       | ,093                      | ,764   | ,448 | -,793                           | 1,777       |
|                           | Duration of Computer Use                    | -,625                       | ,622       | -,111                     | -1,005 | ,318 | -1,866                          | ,616        |
|                           | Weekly Internet Usage Frequency             | ,030                        | 1,992      | ,002                      | ,015   | ,988 | -3,946                          | 4,007       |
|                           | Duration of Internet Use                    | 2,103                       | 4,262      | ,064                      | ,493   | ,623 | -6,404                          | 10,610      |
|                           | Previous Virtual Reality (VR) Use           | 1,279                       | 2,819      | ,179                      | ,454   | ,651 | -4,348                          | 6,906       |
|                           | Weekly Virtual Reality (VR) Usage Frequency | -,029                       | 2,629      | -,004                     | -,011  | ,991 | -5,277                          | 5,219       |
|                           | Frequency of VR Use                         | ,766                        | ,505       | ,245                      | 1,517  | ,134 | -,242                           | 1,773       |
|                           | Cognitive States                            | -,099                       | ,435       | -,029                     | -,229  | ,820 | -,967                           | ,768        |
|                           | Affective States                            | ,066                        | ,492       | ,018                      | ,134   | ,894 | -,915                           | 1,047       |

a. Dependent Variable: impulsebuying