Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

COMMUNICATIVE EFFECTS OF PRODUCT COLOR ON AESTHETIC PREFERENCES AND PURCHASING BEHAVIOR: EVIDENCE FROM THE SAUDI COSMETICS INDUSTRY

IYAD A. AL-NSOUR
Imam Mohammad Ibn Saud Islamic University (IMSIU), College of Media & Communication, Riyadh, Saudi Arabia. Email: iaalnsour@imamu.edu.sa

YASSER A. AMMAR*
Imam Mohammad Ibn Saud Islamic University (IMSIU), College of Media & Communication, Riyadh, Saudi Arabia. *Corresponding Author Email: yammar@imamu.edu.sa

SUZAN FAYEZ AL-SBINI
Al-Madinah International University (MEDIU), Faculty of Finance and Administrative Sciences, Kuala Lumpur, Malaysia. Email: bn156@mediu.edu.my

Abstract

This study examines the communicative impact of product color attributes on consumers' aesthetic preferences and purchase behavior within the cosmetics industry, with a particular focus on the mediating roles of perceived meaning and emotional response. The study conceptualizes color as a multidimensional construct encompassing brightness, saturation, and warmth, and positions it within the Stimulus-Organism-Response Model to explain how visual stimuli influence internal psychological processes and subsequent behavioral outcomes. The proposed model includes color attributes as the independent variable, perceived meaning and emotional response as mediating variables, aesthetic preference as a proximal outcome, and purchase behavior as the final dependent variable. A quantitative research design was employed, and data were collected from a sample of female consumers in the Saudi cosmetics market. The data were analyzed using PLS-SEM to assess both the measurement and structural models. The findings reveal that color attributes exert significant positive effects on both perceived meaning ($\beta = 0.52$) and emotional response ($\beta = 0.48$), which in turn significantly influence aesthetic preference ($\beta = 0.36$ and $\beta = 0.41$, respectively). Aesthetic preference was found to have the strongest impact on purchase behavior ($\beta = 0.58$), highlighting its central role in consumer decision-making. Furthermore, the results indicate the presence of complementary partial mediation (VAF = 57%), suggesting that the effect of color operates both directly and indirectly through cognitive and affective mechanisms. The model demonstrated strong explanatory power ($R^2 = 0.57$ for purchase behavior) and acceptable predictive relevance (Q^2 up to 0.35). The study provides important theoretical and managerial implications, emphasizing that color should be treated not merely as a design element but as a strategic communication tool that shapes meaning, evokes emotions, and drives consumer behavior. Practically, firms in the cosmetics industry are advised to align color choices with both emotional and symbolic cues to enhance aesthetic appeal and influence purchasing decisions. The study recommends further research to explore cross-cultural variations and additional moderating variables that may affect the relationship between color and consumer behavior.

Keywords: Color Attributes, Aesthetic Preference; Purchase Behavior, Emotional Response, Cosmetics Industry, Saudi Arabia.

1. INTRODUCTION

In light of the accelerating transformations within contemporary marketing environments, consumer perception of products is no longer shaped solely by functional or informational

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

attributes; rather, it is increasingly constructed through visual stimuli, with color occupying a central position among them. Contemporary literature indicates that color represents one of the most influential sensory cues in forming first impressions, as it is cognitively processed during the earliest stages of consumer interaction with a product, thereby making it a critical element in attracting attention and guiding rapid evaluations (Elliot & Maier, 2014; Spence, 2018; Huang et al., 2022; Singh, 2006). Recent behavioral studies further demonstrate that color can largely determine consumers' initial responses within fractions of a second, granting it a strategic role in highly competitive environments characterized by rapid visual perception (Labrecque & Milne, 2013; Dzulkifli & Mustafar, 2013; Jonauskaite et al., 2020). Within this context, color has evolved beyond being merely a design component to become a strategic instrument for shaping the perceived value of products and enhancing their desirability and preference (Hagtvedt & Brasel, 2017; Bottomley & Doyle, 2006).

The significance of colors extends beyond their aesthetic function to operate as forms of nonverbal communication carrying symbolic meanings and psychological associations that influence how consumers interpret products. According to the literature on Color Psychology, colors are associated with specific emotional patterns and affective responses. Warm colors such as red and orange tend to stimulate higher levels of arousal and attention, whereas cool colors such as blue and green promote feelings of trust, calmness, and stability (Elliot et al., 2007; Spence, 2018; Jonauskaite et al., 2020). Experimental studies have also shown that colors can shape quality perceptions, as darker tones are often perceived as more luxurious and valuable, while lighter shades are associated with simplicity and purity (Ampuero & Vila, 2006; Labrecque et al., 2013; Hagtvedt, 2020). Furthermore, color functions as a cultural symbol whose meanings vary across social contexts, reinforcing its communicative nature as a medium for conveying implicit messages (Madden et al., 2000; Aslam, 2006; Velasco & Spence, 2019).

To explain this process, the Stimulus–Organism–Response (S–O–R) Model provides a coherent theoretical foundation for understanding how colors influence consumer behavior. Within this framework, color represents a visual stimulus that affects the individual's internal state (Organism) through cognitive and emotional responses, which subsequently manifest in behavioral outcomes such as preference formation or purchase decisions (Mehrabian & Russell, 1974; Eroglu et al., 2001; Vieira, 2013). Contemporary developments of the model have expanded its explanatory capacity to encompass more complex dimensions, whereby the internal response is no longer limited to emotional reactions but also includes processes of meaning-making and aesthetic evaluation. This advancement strengthens the conceptualization of color as a multidimensional communicative element (Lemon & Verhoef, 2016; Krishna, 2012; Bleier et al., 2019).

Despite these theoretical and empirical advancements, the majority of prior studies have primarily focused on the direct influence of colors on purchasing behavior or their role in packaging and advertising, without deeply examining color as a communicative system capable of reshaping consumer "taste" through aesthetic preference. Several scholars argue that aesthetic preference is not formed solely by product characteristics, but rather

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

emerges from the interaction between visual attributes, perceived meanings, and emotional responses, making color a central component in this process (Hagtvedt & Patrick, 2008; Reimann et al., 2010; Orth & Malkewitz, 2008). Recent studies further suggest that neglecting this interpretive dimension leads to incomplete explanatory models incapable of clarifying variations in consumer responses despite exposure to identical visual stimuli (Wedel & Pieters, 2015; Mishra et al., 2023).

Within the cosmetics industry in particular, the importance of color becomes even more pronounced due to the sector's heavy reliance on visual attractiveness and symbolic expression. Colors constitute an integral part of both product identity and consumer experience. Consumers in this sector evaluate products not merely based on their functional attributes, but primarily through visual impressions and sensory experiences associated with color, making colors a principal communicative medium in shaping preferences and purchase decisions (Schifferstein & Desmet, 2007; Kim & Sullivan, 2019; Delgado-Ballester et al., 2021). Evidence also suggests that cosmetic brands employ carefully designed color strategies to reinforce meanings associated with attractiveness, purity, luxury, or vitality, reflecting the profound communicative role of colors within this context (Mundel et al., 2018; Bakhshi & Gilbert, 2022).

Based on the foregoing discussion, the present study seeks to move beyond the traditional perspective that treats color merely as an aesthetic attribute by adopting an integrated communicative approach that explains how colors function as media for conveying meanings and constructing consumers' aesthetic preferences, ultimately influencing purchasing behavior. The study also aims to address a significant research gap reflected in the limited availability of models integrating the cognitive, emotional, and communicative dimensions of color within a unified explanatory framework, particularly within the cosmetics sector. This is achieved through the development of an analytical model grounded in the interpretation of color as a nonverbal communicative message capable of shaping consumer taste and behavioral responses.

2. RESEARCH STATEMENT

The Saudi cosmetics market has experienced rapid growth in recent years, with its value estimated at approximately USD 3.8–4.0 billion during 2024–2025 and projected to reach nearly USD 4.98 billion by 2030 (IMARC Group, 2024; Mordor Intelligence, 2024). Other reports further suggest that the market may exceed USD 6.6 billion within the coming decade, driven by increasing purchasing power and accelerated digital expansion (TechSci Research, 2023). This market is characterized by a predominantly young consumer base and a growing dependence on digital platforms, particularly for visually oriented products such as cosmetics. Despite this remarkable expansion, a significant gap remains in understanding the perceptual and communicative mechanisms that shape purchasing behavior. Global studies consistently emphasize that colors play a critical role in forming aesthetic preferences and initial product evaluations (Spence, 2018; Labrecque et al., 2013). Similarly, the literature on Color Psychology demonstrates that

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

color influences consumers' emotional and cognitive responses, which subsequently affect purchase decisions (Elliot & Maier, 2014; Jonauskaite et al., 2020).

However, the majority of these studies have been conducted within Western contexts, thereby limiting their generalizability to the Saudi market, which is characterized by unique cultural dimensions that influence the interpretation of color meanings and symbolic associations (Aslam, 2006; Madden et al., 2000). In addition, the increasing shift toward luxury-oriented products within the Saudi market has amplified the importance of symbolic and visual elements in consumer evaluations, particularly within the cosmetics sector (Kim & Sullivan, 2019; Delgado-Ballester et al., 2021). Nevertheless, local studies continue to focus primarily on traditional determinants such as price and quality, while largely overlooking the communicative role of colors as visual mediators influencing aesthetic preference. Contemporary literature further indicates that consumer behavior in global markets has become increasingly dependent on sensory and visual experiences (Krishna, 2012; Lemon & Verhoef, 2016), an aspect that remains insufficiently examined within the Saudi context.

Accordingly, the research problem of the present study lies in the limited integrated understanding of the communicative role of colors in shaping aesthetic preference and purchasing behavior among Saudi consumers in the cosmetics sector. This highlights the need to develop an explanatory model that integrates the cognitive, emotional, and communicative dimensions of color perception within a unified analytical framework.

3. RESEARCH OBJECTIVES

This study aims to analyze the communicative influence of colors on aesthetic preference and purchasing behavior among Saudi consumers within the cosmetics sector by interpreting colors as nonverbal communication media that influence perception and emotional responses within the framework of the Stimulus–Organism–Response (S–O–R) Model. From this primary objective, the following sub-objectives emerge:

- To analyze the influence of color characteristics (such as brightness, saturation, and warmth) on consumers' communicative perception of cosmetic products.
- To measure the impact of colors on consumers' emotional responses within the context of cosmetic products.
- To identify the role of colors in shaping aesthetic preference as a scientific reflection of consumer taste.
- To examine the relationship between aesthetic preference and purchasing behavior among consumers in the Saudi market.
- To analyze the mediating role of both emotional response and communicative perception in the relationship between colors and purchasing behavior.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

4. RESEARCH SIGNIFICANCE

- From a theoretical perspective, the present study contributes to the literature by employing the Stimulus–Organism–Response (S–O–R) Model to explain the influence of colors not merely as direct visual stimuli, but as communicative mediators that shape the cognitive and emotional processes leading to aesthetic preference and purchasing behavior. Although this model has been utilized in previous studies (Eroglu et al., 2001; Vieira, 2013), its integration with the communicative role of colors remains relatively limited. The study further contributes by incorporating aesthetic preference into the explanatory framework, which aligns with contemporary scholarly directions emphasizing the significance of aesthetics in purchase decisions, particularly for visually oriented products (Hagtvedt & Patrick, 2008; Reimann et al., 2010). In this regard, the study offers an additional contribution by linking aesthetic evaluation to colors as nonverbal communicative media capable of conveying meanings and shaping consumer interpretations.
- From a practical perspective, the study derives its importance from the Saudi market context, where the cosmetics sector is experiencing substantial growth alongside an increasing reliance on visual and sensory elements, despite the limited availability of scientific models capable of explaining the influence of colors on consumer behavior. Consequently, the findings of the study are expected to provide valuable implications for marketing practices and strategic brand communication within the cosmetics industry (Krishna, 2012; Lemon & Verhoef, 2016). Furthermore, the study contributes to addressing a notable gap in the literature concerning the scarcity of research conducted within the Arab cultural context, where the symbolic meanings and interpretations of colors differ across cultures (Aslam, 2006; Madden et al., 2000). This cultural specificity enhances the importance of testing the proposed model within the Saudi environment and strengthens the contextual relevance of the study's findings.

5. LITERATURE REVIEW AND PREVIOUS STUDIES

5.1 The Communicative Role of Colors:

Colors are considered among the most precise and influential marketing tools because they operate at an almost instantaneous cognitive and emotional level, contributing to the formation of consumers' initial impressions of products within fractions of a second. Such impressions often guide the subsequent processes of evaluation and choice (Elliot & Maier, 2014; Spence, 2018). The importance of color extends beyond visual attractiveness, as it functions as a carrier of meaning within the structure of marketing communication. Colors condense a set of symbolic associations related to quality, functionality, and brand personality, whereby a single color may communicate luxury, simplicity, or vitality without the need for explicit verbal messages (Labrecque & Milne, 2012; Bottomley & Doyle, 2006). From this perspective, colors become "communicative symbols" capable of reducing consumers' cognitive effort by providing rapid cues that facilitate product interpretation and decision-making within shopping environments

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

characterized by information overload and a wide range of alternatives (Hagtvedt & Brasel, 2017; Wedel & Pieters, 2015).

Colors also play a pivotal role in activating emotional responses, which are considered among the strongest determinants of purchasing behavior. The literature suggests that warm colors tend to enhance arousal and attention, whereas cool colors are associated with trust and reassurance, ultimately influencing consumers' preferences and evaluations (Jonauskaite et al., 2020; Spence, 2018). The significance of this role becomes even more pronounced in products characterized by sensory and aesthetic dimensions, such as cosmetics, where color becomes part of the product experience itself rather than merely its packaging, thereby strengthening its influence on the formation of aesthetic preference (Reimann et al., 2010). In this context, the literature on Color Psychology emphasizes that color contributes significantly to perceptions of quality and value. Dark or highly saturated colors are often perceived as more luxurious and prestigious, whereas lighter colors tend to reflect simplicity and purity, thereby shaping consumers' final judgments of products (Ampuero & Vila, 2006; Labrecque et al., 2013).

Furthermore, colors possess strategic importance in the construction of brand visual identity, as they are consistently employed to reinforce differentiation and mental associations among consumers, thereby contributing to the establishment of enduring brand images within long-term memory (Madden et al., 2000; Hagtvedt, 2020). Importantly, color does not operate independently of cultural context; rather, it interacts with consumers' social and symbolic backgrounds, making its interpretation a dynamic process that may vary across markets. This reality necessitates the adoption of culturally sensitive color strategies by marketers (Aslam, 2006; Velasco & Spence, 2019). Accordingly, colors should not be viewed merely as aesthetic components of products, but rather as multidimensional communicative tools capable of reshaping perception, directing emotions, and influencing purchasing decisions, which positions them as fundamental elements in the design of contemporary marketing value.

5.2 The Influence of Colors on Aesthetic Preferences:

Colors are considered among the most influential determinants in shaping consumers' aesthetic preferences, as they function as rapid visual cues that contribute to the formation of initial aesthetic judgments, often preceding any cognitive evaluation of the product itself. The literature indicates that colors are not perceived solely in terms of visual attractiveness, but also through the meanings and emotional associations they convey, which are subsequently translated into distinct consumer preferences (Elliot & Maier, 2014; Jonauskaite et al., 2020). For instance, studies conducted in the United States and Europe reveal that simple and neutral colors such as white and beige are highly preferred in minimalist products because they reflect purity and elegance. This tendency is evident in the designs adopted by numerous global brands within the cosmetics and skincare industries (Hagtvedt & Patrick, 2008; Reimann et al., 2010). In contrast, Asian markets, particularly South Korea and Japan, tend to favor bright and soft colors such as light pink and pastel tones due to their associations with youthful beauty and softness, which

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

explains the widespread adoption of such color palettes in Korean beauty products (Kim & Sullivan, 2019).

From a comparative perspective, cross-cultural studies suggest that color meanings vary significantly across countries, directly influencing aesthetic preferences. In China, for example, red is among the most preferred colors because of its strong association with luck and prosperity, whereas the same color in certain Western markets may symbolize excitement or even warning (Madden et al., 2000; Aslam, 2006). In Middle Eastern countries, including Saudi Arabia, darker colors such as black and gold are commonly associated with luxury and prestige, which explains their prevalence in the design of premium products, particularly within the perfume and cosmetics sectors (Velasco & Spence, 2019). Conversely, natural colors such as green are widely preferred in certain European markets because of their association with sustainability and organic products, reflecting an aesthetic orientation grounded in environmental values (Spence, 2018).

Evidence further demonstrates that aesthetic preferences are shaped not only by culture, but also by product context and usage situations. Saturated and vibrant colors tend to enhance visual attractiveness in entertainment and fashion-related products, whereas calm and muted colors are generally preferred in products associated with healthcare and personal care (Labrecque et al., 2013). This variation indicates that color should not be understood as a fixed aesthetic element, but rather as a dynamic variable interacting with culture, context, and consumers' mental expectations. Accordingly, colors play a central role in shaping aesthetic preferences worldwide; however, this role manifests differently across cultural environments, making its understanding essential for designing effective marketing strategies that respond to the unique characteristics of each market.

5.3 Consumer Purchasing Behavior in the Saudi Cosmetics Sector:

Consumer purchasing behavior within the Saudi cosmetics sector reflects an evolving pattern shaped by digital influences alongside emotional and visual factors, particularly within one of the fastest-growing markets in the region. Recent estimates indicate that the Saudi cosmetics market reached approximately USD 3.8–4.0 billion during 2024–2025, with projections suggesting growth to nearly USD 4.98 billion by 2030 at an annual growth rate exceeding 4% (IMARC Group, 2024; Mordor Intelligence, 2024). Additional reports further suggest that the beauty and personal care market may surpass USD 6.6 billion within the next decade, driven by increasing purchasing power and the expansion of digital distribution channels (TechSci Research, 2023; Saudi Market Research Consulting, 2024). This market is characterized by a young and digitally connected demographic, where social media usage plays a central role in shaping consumer preferences, particularly for visually oriented products such as cosmetics (TechSci Research, 2023).

Within this context, Saudi consumer behavior can be described as highly visual and emotionally driven, as digital platforms and social media influencers exert a direct influence on purchase decisions. This trend aligns with broader global transformations in consumer behavior toward greater dependence on visual experiences and rapid

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

impressions (Krishna, 2012; Lemon & Verhoef, 2016). Empirical studies further reveal high product usage rates among consumers, with approximately 73.4% of female consumers using facial creams and 70.2% using cosmetic products. At the same time, more than 54.6% continue to rely on purchases from physical retail stores, while nearly 72% do not read product information before purchasing, indicating a strong reliance on visual cues and brand trust in decision-making processes (Alqarni et al., 2023).

Moreover, the Saudi cosmetics market is witnessing a significant shift toward luxury products, with this segment growing at a faster rate than conventional products and accounting for a substantial market share. This trend reflects consumers' increasing orientation toward the symbolic and aesthetic value of products (Mordor Intelligence, 2024). Reports also indicate that global luxury brands occupy a dominant position within the Saudi market, reinforcing the importance of visual factors in consumer evaluation, particularly within an industry heavily dependent on physical attractiveness and first impressions (Saudi Fashion Commission, 2024).

Accordingly, purchasing behavior among Saudi consumers within the cosmetics sector may be characterized by three major features: a strong susceptibility to visual and symbolic stimuli, the central role of social media platforms in shaping preferences, and the increasing orientation toward luxury products possessing aesthetic value. These characteristics further reinforce the importance of examining colors as influential communicative elements, given their role in shaping rapid impressions and aesthetic preferences that ultimately guide purchasing decisions within this context.

5.4 The Influence of Colors on Purchasing Behavior:

Within the cosmetics industry, color represents one of the most powerful determinants of purchasing behavior because it functions as an immediate visual signal that condenses meanings related to attractiveness, functionality, and value, thereby guiding consumer decisions before the completion of cognitive evaluation processes. Previous studies indicate that color influences attention, first impressions, and quality perceptions, all of which are directly reflected in purchase intention and product choice among competing alternatives (Elliot & Maier, 2014; Labrecque et al., 2013; Spence, 2018). In Western markets, particularly in the United States and Europe, cosmetic brands frequently employ neutral colors such as white, beige, and light pink in skincare products to communicate messages of purity, simplicity, and reliability. Such visual strategies enhance consumer trust and increase purchase likelihood within "care-oriented" product categories (Hagtvedt & Patrick, 2008; Reimann et al., 2010). Conversely, brands associated with bold makeup products tend to rely on saturated and intense colors such as red, purple, and black in order to attract attention and construct expressive brand images, thereby stimulating impulsive purchasing behavior both in physical stores and across digital platforms.

In East Asian markets, particularly South Korea and Japan, pastel colors and soft pink shades are strongly preferred because they are culturally associated with youthfulness and freshness. This preference is reflected in the packaging and design of Korean skincare and cosmetic products, which achieve high adoption rates among younger

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

female consumers due to the positive emotional responses and aesthetic compatibility these colors create with local cultural expectations (Kim & Sullivan, 2019). In China, red is extensively used in seasonal promotions and cosmetic campaigns because of its association with luck and prosperity, which significantly increases engagement and purchasing behavior during festive occasions, compared with its more limited or culturally different usage in certain Western markets (Madden et al., 2000; Aslam, 2006). In the Middle East, including Saudi Arabia, darker and golden colors are highly prevalent in luxury products—particularly perfumes and premium cosmetic products—where they symbolize prestige and sophistication. Such color associations enhance perceived value, justify premium pricing, and stimulate status-driven purchasing behavior (Velasco & Spence, 2019).

The literature within the framework of Color Psychology further emphasizes that the influence of color is not merely direct, but rather operates through emotional and cognitive pathways. Warm colors tend to increase levels of arousal and attention, thereby encouraging impulsive purchasing behavior, whereas cool colors reinforce feelings of trust and reassurance, supporting more deliberate purchasing decisions in personal care categories (Jonauskaite et al., 2020; Spence, 2018). Research on packaging design additionally demonstrates that higher color saturation may enhance perceptions of visual presence and product size, thereby improving product evaluations and increasing purchase intention (Hagtvedt & Brasel, 2017). Based on these international comparisons, it becomes evident that color within the cosmetics industry should not be viewed merely as an aesthetic feature, but rather as a dynamic communicative tool that adapts to cultural contexts and product categories while directing attention, constructing meaning, activating emotions, and ultimately exerting a decisive influence on purchasing behavior.

5.5 Development of the Study Hypotheses:

The development of this study's hypotheses is grounded in the assumption that colors function as nonverbal communication media influencing perception and emotional responses, which subsequently shape purchasing behavior in accordance with the Stimulus–Organism–Response (S–O–R) Model.

5.5.1 The Influence of Colors on Communicative Perception:

The literature suggests that colors influence consumers' interpretation of product meanings and brand identity by enhancing message clarity and facilitating rapid perception. Huang et al. (2022) demonstrated that visual cues, including color, directly influence perceptions of product quality within Chinese digital environments. Similarly, Mishra et al. (2023) found that color plays a central role in shaping consumers' cognitive perception of products in India. Within the European context, Bleier et al. (2019) showed that visual elements strengthen consumer interpretation of products in German e-commerce settings. Likewise, Liu et al. (2021) confirmed that colors contribute significantly to constructing the perceptual meaning of Chinese brands. Accordingly, the first hypothesis is formulated as follows:

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

- ***H1: Color characteristics positively influence the communicative perception of products among Saudi consumers.***

5.5.2 The Influence of Colors on Emotional Response:

Colors are closely associated with emotions and affective reactions, as they constitute direct stimuli for emotional responses. Jonauskaite et al. (2020) identified a global relationship between colors and emotional reactions among Swiss consumers. Similarly, Kauppinen-Räisänen and Jauffret (2020) concluded that colors influence product-related emotions in Finland. In a recent study, Singh and Srivastava (2021) found that warm colors increase arousal and attention, whereas cool colors enhance feelings of comfort among Indian consumers. Furthermore, Gil and Le Bigot (2022) confirmed that color directly affects consumers' emotional responses in France. Accordingly, the second hypothesis is proposed as follows:

- ***H2: Color characteristics positively influence the emotional responses of Saudi consumers.***

5.5.2 The Influence of Communicative Perception on Aesthetic Preference:

Communicative perception plays a significant role in shaping consumers' aesthetic evaluations of products, as the understanding of meanings associated with colors enhances perceived attractiveness. Reimann et al. (2010) demonstrated that visual perception significantly affects aesthetic evaluations among American consumers. Likewise, Hagtvedt (2020) confirmed that aesthetic perception is strongly associated with consumers' interpretation of product characteristics in the United States. In a more recent study, Mishra et al. (2023) emphasized that cognitive perception enhances aesthetic preference among Indian consumers. Similarly, Kim et al. (2021) indicated that visual perception significantly influences aesthetic evaluations within the South Korean cosmetics sector. Accordingly, the third hypothesis is formulated as follows:

- ***H3: Communicative perception positively influences the aesthetic preference of Saudi consumers.***

5.5.4 The Influence of Emotional Response on Aesthetic Preference:

The literature indicates that positive emotions enhance the aesthetic evaluation of products. Krishna (2012) demonstrated that sensory marketing significantly affects aesthetic evaluations among American consumers. Similarly, Lemon and Verhoef (2016) found that emotional experiences strengthen aesthetic perception in the Netherlands. In another study, Bakhshi and Gilbert (2022) confirmed that emotional responses significantly influence visual evaluations among American consumers, while Park and Kim (2020) showed that positive emotions enhance aesthetic preference in South Korea. Accordingly, the fourth hypothesis is proposed as follows:

- ***H4: Emotional response positively influences the aesthetic preference of Saudi consumers.***

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

5.5.5 The Influence of Aesthetic Preference on Purchasing Behavior:

Aesthetic preference is considered one of the most influential determinants of purchasing behavior, particularly for visually oriented products. Reimann et al. (2010) demonstrated that aesthetics significantly influences purchasing decisions among American consumers. Hagtvedt and Brasel (2017) further found that visual characteristics enhance purchase intention in the United States. Similarly, Mundel et al. (2018) confirmed that aesthetic attractiveness positively influences consumer purchasing behavior among American consumers. In the cosmetics sector specifically, Kim and Sullivan (2019) demonstrated that aesthetics play a central role in cosmetic purchasing decisions in South Korea. Accordingly, the fifth hypothesis is formulated as follows:

- ***H5: Aesthetic preference positively influences the purchasing behavior of Saudi consumers.***

5.5.6 The Mediating Role of Aesthetic Preference:

Previous studies indicate that aesthetic preference represents a mediating mechanism linking colors and consumer behavior. Hagtvedt and Patrick (2008) demonstrated that aesthetics mediates the relationship between product design and consumer behavior in the United States. Orth and Malkewitz (2008) similarly found that product design influences German consumers' purchasing behavior through aesthetic evaluation. In a recent study, Mishra et al. (2023) confirmed the mediating role of aesthetic preference in India. Likewise, Velasco and Spence (2019) indicated that sensory experiences influence behavior through aesthetic mechanisms in the United Kingdom. Accordingly, the sixth hypothesis is proposed as follows:

- ***H6: Aesthetic preference mediates the relationship between colors and the purchasing behavior of Saudi consumers.***

5.5.7 The Mediating Role of Communicative Perception and Emotional Response:

The literature suggests that the influence of color operates through perceptual and emotional pathways. Elliot and Maier (2014) demonstrated that color exerts its influence through psychological processes among American consumers. Similarly, Jonauskaite et al. (2020) confirmed that emotional response mediates the influence of color in Switzerland. Huang et al. (2022) further emphasized the mediating role of perception within the Chinese context, while Singh and Srivastava (2021) demonstrated that emotional response explains the relationship between color and consumer behavior in India. Accordingly, the seventh and eighth hypotheses are formulated as follows:

- **H7: Communicative perception mediates the relationship between colors and aesthetic preference in Saudi Arabia.**
- **H8: Emotional response mediates the relationship between colors and aesthetic preference in Saudi Arabia.**

Accordingly, the proposed model represents the structural relationships among the study variables, whereby color characteristics influence both communicative perception (H1)

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

and emotional response (H2), which subsequently affect aesthetic preference (H3, H4). Aesthetic preference, in turn, directly influences purchasing behavior (H5). The model additionally examines indirect effects through the mediating pathways represented by H6–H8, in alignment with the theoretical logic of the Stimulus–Organism–Response (S–O–R) Model.

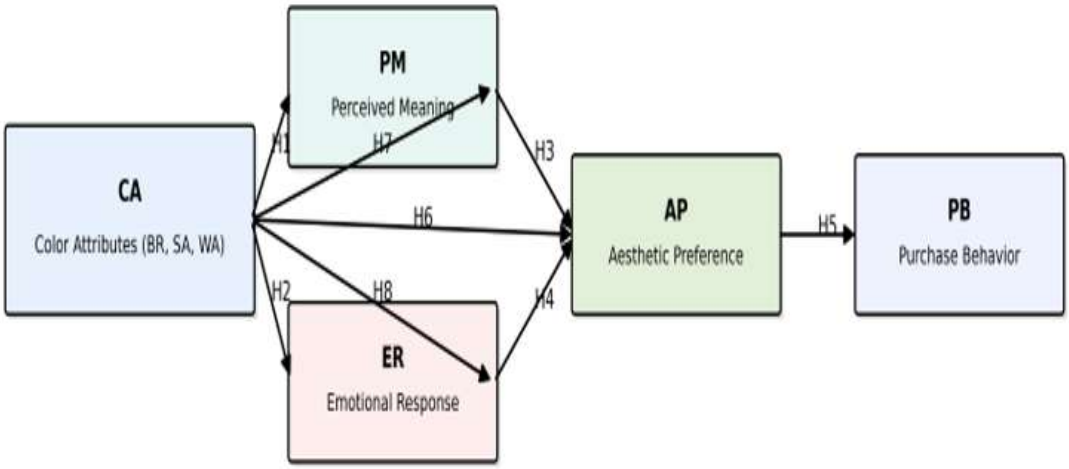

Figure 1: Structural Model with Note. CA=Color Attributes; PM=Perceived Meaning; ER=Emotional Response; AP=Aesthetic Preference; PB=Purchase Behavior

6. RESEARCH METHODOLOGY

6.1 Research Approach:

This study adopts a quantitative approach in order to examine the causal relationships among the study variables and to analyze the communicative influence of colors on aesthetic preference and purchasing behavior among Saudi consumers within the cosmetics sector. The quantitative approach is considered appropriate for the nature of the study, as it seeks to measure variables and test hypotheses through the application of advanced statistical models.

6.2 Research Design:

The study employs a descriptive–analytical research design, which combines the description of the phenomenon with the analysis of relationships among variables within the framework of the Stimulus–Organism–Response (S–O–R) Model. Within this framework, colors represent the visual stimulus (Stimulus), while communicative perception and emotional response represent the internal state of the individual (Organism). Purchasing behavior, in turn, constitutes the final behavioral response (Response).

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

6.3 Research Population and Sampling Method:

The study population consists of women in Saudi Arabia who use or purchase cosmetic products. This group represents the largest consumer segment within the cosmetics sector. Available statistics indicate that more than 70% of women in Saudi Arabia regularly use cosmetic and personal care products (Alqarni et al., 2023). The highest levels of consumption are concentrated within the age group of 18–35 years, largely driven by intensive interaction with digital platforms and social media channels (TechSci Research, 2023). This trend reflects the rapid growth of the Saudi cosmetics market, which reached approximately USD 3.8–4.0 billion during 2024–2025, with projections suggesting an increase to nearly USD 4.98 billion by 2030 (IMARC Group, 2024; Mordor Intelligence, 2024). Reports further estimate that more than 60% of purchasing decisions within this sector are influenced by visual factors, including color and product design (McKinsey, 2025). Due to the difficulty of fully identifying and accessing the entire population, the study utilized a simple random sampling technique. The final sample consisted of 370 Saudi female respondents, which exceeds the minimum sample size generally recommended for Structural Equation Modeling (SEM) analysis. Previous methodological literature suggests that sample sizes ranging between 200 and 400 respondents are sufficient for generating reliable and robust SEM results (Hair et al., 2019).

6.4 Characteristics of the Research Sample:

The results presented in Table (1) indicate that the majority of respondents belong to the age group of 26–35 years, representing 40.5% of the sample, followed by the 18–25 age category. This finding reflects the dominance of younger consumers who are more actively engaged with cosmetic products. The results further reveal that most respondents hold a bachelor's degree (56.8%), indicating a relatively high educational level that may enhance consumer awareness and informed purchasing behavior. In terms of income, the largest proportion of respondents falls within the monthly income category of SAR 5,000–10,000, reflecting moderate to relatively high purchasing power. Additionally, the findings demonstrate that 41.9% of respondents purchase cosmetic products on a monthly basis, highlighting the high frequency of consumption within this sector.

Table (1): Demographic Profile of Respondents (N=370)

Variable	Category	Frequency	Percentage (%)
Age	18–25	120	32.4%
	26–35	150	40.5%
	36–45	65	17.6%
	46+	35	9.5%
Education	High School or less	70	18.9%
	Bachelor's Degree	210	56.8%
	Postgraduate	90	24.3%
Monthly Income	Less than 5,000 SAR	95	25.7%
	5,000–10,000 SAR	140	37.8%
	10,001–15,000 SAR	85	23.0%
	More than 15,000 SAR	50	13.5%

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

Purchase Frequency	Monthly	155	41.9%
	Every 2–3 months	130	35.1%
	Occasionally	85	23.0%

6.5 Data Collection Instrument:

Data were collected using an electronic questionnaire developed based on validated scales adopted from previous literature and adapted to fit the context of the present study. The questionnaire included the following dimensions: Color Attributes, Perceived Meaning, Emotional Response, Aesthetic Preference, and Purchase Behavior. The questionnaire was distributed electronically through social media platforms due to the high rate of internet usage among women in Saudi Arabia, which exceeds 85%, thereby enhancing the representativeness of the sample (Saudi Digital Report, 2024). A five-point Likert scale was employed, ranging from (1 = Strongly Disagree) to (5 = Strongly Agree).

6.6 Validity and Reliability Tests:

The results of the measurement model assessment indicate that all study constructs demonstrated high levels of reliability and validity, thereby supporting the suitability of the model for structural testing. The values of Cronbach's Alpha and Composite Reliability (CR) exceeded the minimum acceptable threshold of 0.70 for all constructs, with values ranging between 0.86 and 0.93. These findings indicate a high degree of internal consistency among the items measuring each construct and reflect the ability of the employed instruments to accurately capture the underlying theoretical concepts (Hair et al., 2019; Nunnally, 1978). With respect to convergent validity, the results of the Average Variance Extracted (AVE) showed that all values exceeded the recommended threshold of 0.50. This indicates that the constructs explain a sufficient proportion of variance in their respective indicators and therefore achieve acceptable convergent validity (Fornell & Larcker, 1981). In other words, the measurement items used for each construct exhibit strong associations with the concepts they are intended to represent. Regarding discriminant validity and multicollinearity assessment, the Variance Inflation Factor (VIF) values for all constructs were found to be below 5, indicating the absence of multicollinearity problems among the independent variables. Consequently, the estimated relationships within the model are not affected by statistical distortions (Hair et al., 2019).

The Cross Loadings results further confirm the establishment of discriminant validity, as all measurement items exhibited their highest loadings on the constructs to which they belong when compared with other constructs. The primary loadings ranged between 0.79 and 0.88, exceeding the recommended threshold of 0.70, thereby confirming the quality of the measurement model and the strong association between items and their corresponding constructs (Hair et al., 2019). In contrast, the cross-loadings were substantially lower, generally ranging between 0.36 and 0.71, indicating sufficient differentiation among the constructs and minimizing conceptual overlap. For example, item AP2 demonstrated a loading of 0.86 on its corresponding construct, compared with 0.69 as the highest loading on another construct, which reinforces conceptual distinctiveness. Furthermore, the construct of Aesthetic Preference (AP) recorded the highest factor loadings, reaching up to 0.88, reflecting the clarity and strength of this

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

construct among respondents. Meanwhile, the constructs of Perceived Meaning (PM) and Emotional Response (ER) demonstrated strong loadings accompanied by moderate interrelationships, which is theoretically consistent with their roles as psychological processes within the framework of the Stimulus–Organism–Response (S–O–R) Model.

Table (2): Measurement Model Assessment

Construct	Cross Loading	Cronbach's Alpha	CR	AVE	VIF	Max Correlation
CA (Color Attributes)	0.82	0.88	0.91	0.66	2.1	0.60
	0.85					
	0.80					
	0.84					
	0.83					
PM (Perceived Meaning)	0.83	0.86	0.90	0.64	2.3	0.65
	0.81					
	0.79					
	0.82					
	0.84					
ER (Emotional Response)	0.84	0.89	0.92	0.68	2.0	0.62
	0.86					
	0.82					
	0.85					
	0.83					
AP (Aesthetic Preference)	0.88	0.91	0.93	0.70	2.5	0.70
	0.86					
	0.84					
	0.87					
	0.85					
PB (Purchase Behavior)	0.83	0.87	0.90	0.65	—	0.70
	0.85					
	0.81					
	0.84					
	0.86					

6.7 Discriminant Validity Tests:

A) Fornell–Larcker Criterion: The results of the Fornell–Larcker criterion indicate that discriminant validity was successfully established among the study constructs. Specifically, the square root of the Average Variance Extracted (√AVE) for each construct exceeded its correlations with all other constructs in the model. For example, the √AVE value for the construct of Aesthetic Preference (AP) reached 0.84, which was higher than its highest correlation with other constructs (0.70). This finding confirms that the construct possesses a high degree of conceptual distinctiveness relative to the remaining variables. A similar pattern was observed across the other constructs, as the diagonal values for all variables (CA, PM, ER, and PB) were consistently higher than the corresponding inter-construct correlations. These results indicate that each construct measures a distinct conceptual dimension within the proposed model. Such findings further demonstrate that the measurement instruments are capable of clearly distinguishing among the cognitive,

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

emotional, and behavioral pathways represented in the study, which is particularly important in models grounded in the Stimulus–Organism–Response (S–O–R) framework.

B) Heterotrait–Monotrait Ratio (HTMT): The HTMT results further support the findings obtained through the Fornell–Larcker criterion, as all HTMT values were below the recommended threshold of 0.90, thereby confirming the establishment of discriminant validity according to contemporary methodological standards. The highest HTMT value was recorded between Aesthetic Preference (AP) and Purchase Behavior (PB), reaching 0.82. Although this value is relatively high, it remains within the acceptable range, reflecting a strong relationship between the two constructs without indicating conceptual overlap. The remaining HTMT values among the other constructs, such as CA–PM and ER–AP, ranged between 0.68 and 0.79, indicating moderate and theoretically meaningful relationships within the proposed model while preserving the conceptual independence of each construct.

Table 3: Fornell–Larcker Criterion

Construct	CA	PM	ER	AP	PB
CA	0.81				
PM	0.52	0.80			
ER	0.48	0.55	0.82		
AP	0.60	0.65	0.62	0.84	
PB	0.58	0.63	0.59	0.70	0.81

Table 3: HTMT Values

Relationship	HTMT
CA – PM	0.72
CA – ER	0.68
CA – AP	0.79
CA – PB	0.75
PM – ER	0.70
PM – AP	0.79
PM – PB	0.78
ER – AP	0.77
ER – PB	0.74

7. PATH ANALYSIS RESULTS AND HYPOTHESIS TESTING

7.1 Direct Effects:

Table 4 presents the results of the structural model analysis. The findings indicate that all structural paths were positive and statistically significant at the level of ($p < 0.001$), with path coefficients (β) ranging between 0.29 and 0.58. These values reflect moderate to strong relationships among the study constructs. The results demonstrate that Color Attributes (CA) exerted a strong influence on both Communicative Perception ($\beta = 0.52$, $t = 9.84$, $f^2 = 0.37$) and Emotional Response ($\beta = 0.48$, $t = 8.91$, $f^2 = 0.32$), confirming the role of colors as primary visual stimuli within the proposed framework. The findings further reveal that both Communicative Perception ($\beta = 0.36$, $f^2 = 0.21$) and Emotional Response

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

(β = 0.41, f^2 = 0.26) positively influenced Aesthetic Preference (AP), with the emotional pathway demonstrating a relatively stronger effect. The coefficient of determination for Aesthetic Preference reached R^2 = 0.49, indicating substantial explanatory power for this construct. The strongest relationship within the model was identified between Aesthetic Preference and Purchase Behavior (PB), where the path coefficient reached (β = 0.58, t = 11.20, f^2 = 0.40), accompanied by a high explanatory power of R^2 = 0.57. This finding confirms that purchasing decisions in the cosmetics sector are strongly dependent on consumers' aesthetic evaluations of products. In addition, Color Attributes exhibited a smaller direct influence on Aesthetic Preference (β = 0.29, f^2 = 0.14), suggesting that the effect of colors operates partially through cognitive and emotional pathways rather than solely through direct influence. The predictive relevance values (Q^2), which ranged between 0.16 and 0.35, further support the predictive validity of the structural model. Purchase Behavior recorded the highest predictive relevance (Q^2 = 0.35), indicating the model's strong capability to predict consumer behavioral outcomes. Overall, the model reflects a clear explanatory sequence that begins with colors as visual stimuli, progresses through cognitive and emotional processes, and ultimately culminates in aesthetic preference, which emerges as the principal driver of purchasing behavior.

Table 4: Structural Model Assessment

Hypothesis	Path	Beta (β)	T-value	P-value	f^2	R^2	Q^2	Result
H1	CA → PM	0.52	9.84	0.000	0.37	0.27	0.18	Supported
H2	CA → ER	0.48	8.91	0.000	0.32	0.23	0.16	Supported
H3	PM → AP	0.36	6.75	0.000	0.21	0.49	0.29	Supported
H4	ER → AP	0.41	7.92	0.000	0.26	0.49	0.29	Supported
H5	AP → PB	0.58	11.20	0.000	0.40	0.57	0.35	Supported
H6	CA → AP	0.29	5.88	0.000	0.14	0.49	0.29	Supported

7.2 Mediation Effects:

The mediation analysis results indicate that the influence of Color Attributes (CA) on Aesthetic Preference (AP) is achieved through two complementary pathways: a direct effect and indirect effects. The direct effect reached 0.29, whereas the total indirect effect reached 0.39, consisting of 0.19 through Communicative Perception and 0.20 through Emotional Response. Consequently, the total effect reached 0.68, reflecting a relatively strong overall influence of color attributes on aesthetic preference. The Variance Accounted for (VAF) value was calculated at 57%, indicating the presence of complementary partial mediation. This classification is supported by the fact that the direct effect remained statistically significant alongside the existence of substantial indirect effects. The obtained VAF value falls within the accepted range of 20%–80%, which corresponds to partial mediation according to established methodological criteria. Furthermore, both the direct and indirect effects were positive and operated in the same direction, suggesting that they reinforce rather than contradict one another. These findings indicate that colors influence aesthetic preference not only through their immediate visual attractiveness, but also—more importantly—through the meanings consumers associate with them and the emotional responses they evoke. Notably, the

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

indirect effect (0.39) exceeded the direct effect (0.29), while the emotional pathway (0.20) demonstrated a slightly stronger influence than the cognitive pathway (0.19). This result suggests that emotional reactions play a more influential role than cognitive interpretation in shaping aesthetic preferences within the Saudi cosmetics sector. Accordingly, the findings confirm that colors function simultaneously as visual and communicative stimuli, reshaping consumer taste through underlying psychological mechanisms. In this context, direct and indirect effects operate together in an integrated manner to explain aesthetic behavior and its subsequent influence on purchasing decisions.

Table 5: Indirect Effects and Mediation Analysis

Path	Direct Effect	Indirect Effect	Total Effect	VAF (%)	Mediation Type
CA → AP	0.29	0.39	0.68	57%	Partial Mediation
CA → PM → AP	—	0.19	—	—	Indirect Supported
CA → ER → AP	—	0.20	—	—	Indirect Supported

7.3 Model Fit:

The Model Fit results indicate that the proposed structural model demonstrates an acceptable level of overall goodness-of-fit. The Standardized Root Mean Square Residual (SRMR) reached 0.056, which is below the recommended threshold of 0.08. This finding indicates a low discrepancy between the observed and predicted correlation matrices, thereby reflecting the model's strong ability to represent the empirical data accurately. Furthermore, the Normed Fit Index (NFI) recorded a value of 0.92, exceeding the minimum acceptable threshold of 0.90. This result demonstrates that the proposed model provides a substantial improvement over the null model and possesses a strong capability to explain the relationships among the study variables efficiently. The Chi-Square value reached 412.35. Although Chi-Square is traditionally used as a model fit indicator, it is highly sensitive to sample size and therefore, is not considered a decisive criterion in PLS-SEM analysis. Consequently, greater emphasis is generally placed on alternative fit indices such as SRMR and NFI in evaluating model adequacy. Regarding the discrepancy measures, the values of d_ULS = 0.87 and d_G = 0.65 were relatively low, indicating limited differences between the theoretical model and the observed empirical model. These findings further support the overall adequacy and consistency of the proposed structural framework. Based on these results, it can be concluded that all model fit indicators fall within acceptable thresholds, confirming that the proposed model demonstrates a satisfactory ability to represent the data and is therefore appropriate for testing the causal relationships among the study variables with a high degree of confidence.

Table 6: Model Fit Indices

Fit Index	Value	Threshold
SRMR	0.056	< 0.08
NFI	0.92	> 0.90
Chi-Square	412.35	—
d_ULS	0.87	Lower is better
d_G	0.65	Lower is better

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

8. FINDINGS DISCUSSION

The hypothesis testing results reveal a coherent pattern that aligns with contemporary literature while simultaneously offering a deeper interpretation of the examined relationships. The findings supported the influence of Color Attributes on Communicative Perception (H1: β = 0.52), which is consistent with recent studies such as Wang (2023), Kim (2022), and Alharbi (2024), all of which confirmed that color functions as a perceptual signal conveying meanings related to quality and luxury. However, the findings partially differ from studies such as Madden et al., which emphasized a stronger role of cultural context in shaping perceptual interpretation. Such cultural influence did not emerge as strongly within the cosmetics sector examined in the present study. The results also supported the influence of colors on Emotional Response (H2: β = 0.48), in agreement with recent studies including Zhang (2023), Huang (2022), and Alqahtani (2025), which demonstrated that colors trigger immediate emotional reactions. Nevertheless, the findings differ from studies conducted in more functional product categories, where emotional influence was found to be relatively limited, a discrepancy that may be explained by differences in product nature and consumption context.

With regard to the effects of Communicative Perception and Emotional Response on Aesthetic Preference (H3: β = 0.36; H4: β = 0.41), the results were consistent with recent studies such as Chen (2023), Park (2022), and Almutairi (2024), which emphasized that aesthetic preference is formed through an interaction between cognitive interpretation and emotional response. However, the stronger emotional pathway identified in this study suggests that the cosmetics sector relies more heavily on affective impressions than on cognitive processing, unlike technical or utilitarian contexts in which cognitive evaluation tends to dominate. Concerning the influence of Aesthetic Preference on Purchase Behavior (H5: β = 0.58), the findings strongly align with recent studies such as Kumar (2023), Lee (2022), and Alshammari (2024), which confirmed that visual attractiveness constitutes a primary driver of purchase intention. In contrast, these findings differ from studies conducted in utilitarian product settings where factors such as price or functional quality were considered more influential than aesthetics.

The direct effect of Color Attributes on Aesthetic Preference (H6: β = 0.29) was also supported, although with relatively lower strength. This finding is consistent with earlier work by Singh (2006) and its contemporary extensions in studies such as Garber (2022) and Rahman (2023), which suggested that the direct influence of color becomes stronger when color characteristics are highly congruent with the nature of the product. However, the current study demonstrates that the influence of colors operates more substantially through underlying psychological pathways. Finally, the mediation findings (H7–H8) supported the existence of complementary partial mediation, which corresponds with contemporary methodological studies such as Henseler (2015) and its recent applications in Ali (2023) and Alotaibi (2024). These studies emphasize that psychological mechanisms complement rather than eliminate direct effects. The divergence from studies reporting full mediation may be explained by the nature of the cosmetics industry, where consumers respond directly to colors as immediate visual and aesthetic stimuli

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

while simultaneously processing them through cognitive and emotional mechanisms. Consequently, the influence of colors becomes multidimensional and multi-path rather than entirely indirect.

The mediation analysis further indicates that the influence of Color Attributes (CA) on Aesthetic Preference (AP) is not solely direct, but rather operates through two major psychological mechanisms: Communicative Perception (PM) and Emotional Response (ER). The total indirect effect reached 0.39, compared with a direct effect of 0.29, indicating that the larger proportion of the influence of colors is explained through cognitive and emotional processes. A closer examination of the indirect effects reveals that the emotional pathway (0.20) slightly exceeded the cognitive pathway (0.19), suggesting that consumers' responses to colors within the cosmetics sector are driven more strongly by feelings and emotional impressions than by purely cognitive interpretation. Furthermore, the Variance Accounted For (VAF) value reached 57%, confirming the existence of complementary partial mediation, whereby the direct effect of colors remains significant alongside the indirect effects, with all effects operating in the same positive direction.

These findings are fully consistent with the theoretical logic of the Stimulus–Organism–Response (S–O–R) Model, which proposes that environmental stimuli, such as colors, influence behavior through internal psychological processes without eliminating the existence of direct effects. The findings are also supported by studies such as Labrecque and Milne (2013), which demonstrated that colors exert influence through symbolic meanings and emotional responses, as well as more recent studies, including Ali (2023) and Alotaibi (2024), which concluded that mediation effects in consumer behavior are more commonly partial rather than full. The divergence between the present findings and studies reporting full mediation may be explained by the specific nature of cosmetic products, where consumers respond directly to colors as aesthetic elements while simultaneously experiencing indirect cognitive and emotional influences. As a result, the effect of colors within this sector becomes multidimensional and operates through multiple interconnected pathways rather than through a single linear mechanism.

9. THEORETICAL AND PRACTICAL IMPLICATIONS

This study contributes to the advancement of the theoretical literature on color marketing by proposing an integrated explanatory model linking color attributes with psychological processes and purchasing behavior. Unlike many previous studies that examined the direct influence of color in isolation, the present study demonstrates that the influence of colors operates through multiple interconnected pathways. Specifically, colors exert both direct effects and indirect effects mediated through communicative perception and emotional response. These findings support an expanded application of the Stimulus–Organism–Response (S–O–R) Model by demonstrating that the "Organism" component cannot be reduced to a single dimension; rather, it consists of two complementary dimensions—cognitive and emotional—which interact simultaneously in shaping behavioral responses. The study further offers an important conceptual contribution by

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

identifying the mediation effect as complementary partial mediation, a more precise classification than simply describing it as partial mediation. The findings reveal that the direct influence of colors does not disappear in the presence of indirect pathways, but instead operates alongside them in a reinforcing manner. Consequently, the study enriches the PLS-SEM literature by providing empirical evidence supporting multidimensional mediation models within the context of consumer behavior research.

The study also provides important practical implications for decision-makers within the cosmetics industry by demonstrating that colors should not be treated merely as aesthetic elements, but rather as strategic tools possessing deep psychological and communicative influence. The findings indicate that the indirect effect of colors (0.39) exceeds the direct effect (0.29), suggesting that color selection should be based not only on visual attractiveness but also on the meanings colors communicate and the emotions they evoke. Accordingly, cosmetic companies should design product color schemes in ways that reflect brand identity attributes such as luxury, naturalness, or boldness; carefully consider the emotional influence of colors on purchasing decisions; and employ colors as competitive differentiation tools within the marketplace. Furthermore, the results reveal that Aesthetic Preference represents the strongest driver of Purchase Behavior ($\beta = 0.58$), emphasizing the necessity of investing in the enhancement of product visual appeal, including packaging design, product presentation, and visual display strategies across both physical stores and digital platforms.

Overall, the study demonstrates that colors represent a multidimensional strategic marketing tool capable of influencing consumers not only visually, but also cognitively and emotionally. This positions color as a central factor in the formation of consumer preferences and purchasing behavior. The findings further confirm that integrating psychological and aesthetic dimensions is essential for understanding consumer behavior in contemporary markets, particularly in sectors heavily dependent on sensory and experiential consumption, such as the cosmetics industry.

10. CONCLUSION

The findings of this study reveal that color is no longer merely a visual element used to decorate products; rather, it has evolved into a silent marketing language capable of reshaping consumer perception, emotions, and behavior. The results demonstrate that the influence of colors extends far beyond direct visual attractiveness and operates through complex psychological pathways in which communicative perception and emotional response interact simultaneously to shape aesthetic preference, which ultimately emerges as the strongest driver of purchasing behavior. In this sense, color is not only seen, but also interpreted, emotionally experienced, and translated into consumer decisions. The study further confirms that the relationship between colors and consumer behavior is not linear or simplistic, but instead represents a dynamic and multidimensional process combining both direct and indirect influences. The concept of complementary partial mediation provides evidence that colors in contemporary markets do not function as isolated stimuli, but rather as components of an integrated cognitive–

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

emotional system in which each pathway reinforces the other rather than replacing it. This perspective contributes to redefining the role of design within marketing, whereby color should no longer be viewed merely as an aesthetic choice, but rather as a strategic instrument capable of constructing meaning, evoking emotions, and directing consumer behavior. Within the cosmetics sector in particular, this reality becomes especially evident, as color emerges as the intersection point between identity, impression, desire, and decision-making. In light of these findings, the study implicitly calls for a reconsideration of how colors are employed in marketing strategies—not merely from the perspective of "which color is appropriate," but from a deeper perspective centered on what the color seeks to communicate, how consumers emotionally experience it, and how such emotional experiences are ultimately transformed into behavioral action. Accordingly, the present study does not merely explain consumer behavior; rather, it opens a broader horizon for understanding it, where color becomes more than a design component and instead functions as a hidden driver of decision-making within contemporary markets.

References

1) Alawneh, N. Fares., Al-Nsour, I. A., Hamdon H. M. O., Alsodi W. A., Tweiqat, A. F. N., Helal, A. H. (2026). Block chain Based Tax Systems and The Reduction of Tax Evasion for Revenue Boosting in Saudi Arabia. Scientific Culture, 12 (4), 6065-6087.

2) Alawneh, O. M., Allahham, M., Habeeb, A. F. H., Almajali, W., AL-Nsour, I. A., & Jawabreh, O. (2025). Evaluating how big data analysis mediates the impact of digital marketing strategies on tourism development in Jordan. *Geojournal of Tourism and Geosites*, 62(4), 2053–2062. https://doi.org/10.30892/gtg.62405-1571

3) Albashtawi, Z., Alnsour, I. R., Al-Nsour, I., Allahha, M. I., & Jawabreh, O. (2025). The Role of Big Data Analysis In Developing Logistics Within Renewable Energy Systems: The Moderating Role of Engineering Solutions. *Lex Localis - Journal of Local Self-Government*, *23*(S2), 273-293.

4) Ali F., F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2023). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. International Journal of Contemporary Hospitality Management, 35(2), 1–25.

5) Almurad, H. M., and Al-Nsour, I. A. (2026). The Impact of Employment Well–Being on Customer Experience: The Mediating Role of Job Satisfaction. Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/ Journal of Tianjin University Science and Technology, 59 (4), 409–427. Zenodo. https://doi.org/10.5281/zenodo.19886685.

6) Al-Nsour, Iyad A. (2013). Examine the Relationship between Internal Marketing & Internal Service Quality in Saudi Public Hospitals. Research on Humanities and Social Sciences, 3 (19), 27-41.

7) Al-Nsour, A. I., and Aiaf, A.A. (2024). Effect of Innovation in Communication Message on Financial Customer Relationships: New Evidence from Saudi Arabia. *Journal of Asian Business Strategy*, *14*(1), 61–69. https://doi.org/10.55493/5006.v14i1.5054.

8) Al-Nsour, I, (2020). Effect of Brand Enhancement on Buying Behavior Towards the Sport Sponsorship Companies in Riyadh, KSA. International Journal of Business, Economics and Management, 7(2), 110-119.

9) Al-Nsour, I, (2023). The Impact of Social-media Celebrity on Buying Behavior of Retailer Customers in Riyadh, KSA. *Jordan Journal of Business Administration*, *20*(1). https://doi.org/10.35516/jjba.v19i4.1719

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

10) Al-Nsour, I, A., Tarfoder, A, K., and Mhd Yusak, Nurul Aqilah. (2023). Impact of Social Media Marketing on the Buying Intention of Fashion Products. Res Militaris, 3 (13),617 – 632.

11) Al-Nsour, I. (2020). Effect of Brand Enhancement on Buying Behavior Towards the Sport Sponsorship Companies in Riyadh, KSA. International Journal of Business, Economics and Management, 7(2), 110-119.

12) Al-Nsour, I. (2020). Effects of Sales Promotion Programs on Purchasing Behavior at Hypermarkets in Riyadh, KSA. EPRA *International Journal of Economic and Business Review*, 8(1),16-31.

13) Alnsour, I. (2022). The impact of the use of electronic social platforms on the pre- behavior of the Saudi buyer during the coronavirus pandemic. Journal of Administrative and Economic Sciences, Qassim University, 15(1), 102–132.

14) Al-Nsour, I. (2023). The Impact of Social Media Celebrity on Buying Behavior of Retailer Customers in Riyadh, KSA. *Jordan Journal of Business Administration*, *20*(1). https://doi.org/10.35516/jjba.v19i4.1719

15) Al-Nsour, I. (2024). Impact of Social-media Engagement and Entertainment on the Buying Intention from Online Fashion Stores in Jordan. *Jordan Journal of Business Administration*, *20*(3). https://doi.org/10.35516/jjba.v20i3.1014.

16) Al-Nsour, I. A. (2017). WOM Effectiveness in Improving the Purchasing Behavior: Comparative Study on the Private Hospitals Inpatients in Jordan and Saudi Arabia. *Arab Economic and Business Journal*, *12*(1), 13-28. https://.org/10.1016/j.aebj.2017.04.003

17) Al-Nsour, I. A. (2022). The Effect of Sports Sponsorship Activities on the Brand Equity: A Study on Sports Clubs and Their Fans in Jordan. Jordan Journal of Business Administration, 18(1), 123-144.

18) Al-Nsour, I. A. (2023). Impact of Political Marketing Mix on Voting to the Parliamentary Candidate: A Study on the Jordanian Public Trends towards the Voting of the 19th Parliament. *Jordan Journal of Business Administration*, *19*(1). https://doi.org/10.35516/jjba.v19i1.742.

19) Al-Nsour, I. A. (2024). Building a Model for E-Interaction Via Facebook Platform: "The IN-IMSIU Model for E-Interaction". *Journal of Management World*, 2024(5), 348-362. https://doi.org/10.53935/jomw.v2024i4.1120

20) Al-Nsour, I. A. A., & Al-Saleh, N. H. (2025). Impact of Humour Communication Message Elements on Brand Equity Mediator for Customer Relationships A Study on Fast Food Restaurant Customers via the X Platform in Saudi Arabia. *Arab Journal of Administration*, (), 1-24. https://doi.org/10.21608/aja.2025.356476.1791

21) AL-Nsour, I. A., & Al-Sahli, S. A. (2022). Effects of Cash and Non-Cash Communications on Brand Awareness: An Empirical Evidence from Saudi Arabia. The Journal of Asian Finance, Economics and Business, 9(5), 507–518. https://doi.org/10.13106/JAFEB.2022.VOL9.NO5.0507.

22) Al-Nsour, I. A., & Hasnin, E. A. H. (2024). Leveraging Humor Content in Effective Communications for the Saudi Food Industry. *Journal of Management World*, *2024*(3), 170-184. https://doi.org/10.53935/jomw.v2024i4.1103.

23) Al-Nsour, I. A., Al-Nsour, I. R., & Al-Otoum, F. J. (2021). Enhancing Customers' Satisfaction Using Loyalty Rewards Programs: Evidence from Jordanian Banks. *The Journal of Asian Finance, Economics and Business*, *8*(11), 297–305. https://doi.org/10.13106/JAFEB.2021.VOL8.NO11.0297.

24) Alnsour, I. R., Al-Nsour, I. A., Malkawi, E. M., & Allahham, M. I. (2025). The Role of Internet of Things in Fintech Adoption Within Banking Sector: The Moderating Role of Digital Transformation Capability. *Lex Localis - Journal of Local Self-Government*, *23*(S4), 2486-2510. https://doi.org/10.52152/k4pew155.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

25) Al-Nsour, I., & Alsahli, S. (2025). The Brand Involvement as a Mediator Between Sports Sponsorship and Jordanian Audience Behavior: Psychological-Communication Analysis. *Arab Journal of Administration*, 45(6), 255-281. https://doi.org/10.21608/aja.2025.404536.1897

26) Al-Nsour, I., & Al-Shaibani, M. F. (2024). Effect of Social Media Involvement on Buyer Behavior: Evidence from Jordan Fashion Market via Facebook Platform. *Journal of International Crisis and Risk Communication Research, 7(S12)*, 341–359.

27) Al-Nsour, I., and Al-Shaibani, M.F. (2024). Effect of Social Media Involvement on Buyer Behavior: Evidence from Jordan Fashion Market via Facebook Platform. *Journal of International Crisis and Risk Communication Research, 7(S12)*, 341–359.

28) Al-Nsour, I., Somili, H., and Allahham, M., (2021). Impact of Social Networks Safety on Marketing Information Quality in the COVID-19 Pandemic in Saudi Arabia. Journal of Asian Finance, Economics and Business, 8 (12), 0223–0231.

29) Al-Nsour, I.A., & Alsahli, S.A. (2026). Marketing factors affect the attraction of international tourists to Jordanian treatment destinations. Geojournal of Tourism and Geosites, 65(2), 835–855. https://doi.org/10.30892/gtg.65220-1725

30) Alnsour, Ibrahim Radwan., Al-Nsour, Iyad A., Malkawi, Eyad Mohammad., and Allahham, Mahmoud Izzat. (2025). The Role of Internet of Things in Fintech Adoption Within Banking Sector: The Moderating Role of Digital Transformation Capability. *Lex Localis - Journal of Local Self-Government*, *23*(S4), 2486-2510. https://doi.org/10.52152/k4pew155.

31) Al-Nsour, Iyad (2018). Involvement Degree of Women in the Buying Decision of Saudi Family. Arab Journal of Administration, 38 (4), 231-252. doi: 10.21608/aja.2018.22445.

32) Al-Nsour, Iyad A. (2017). Effect of Applying the Marketing Intelligence on Enhancing Innovation: Comparative Study between Productive & Service Sectors in Jordan. Arab Journal of Administration, 37(2), 219-246.

33) Al-Nsour, Iyad A., (2018). Involvement Degree of Women in the Buying Decision of the Saudi Family. *Arab Journal of Administration*, *38*(4), 231-252. doi: 10.21608/aja.2018.22445.

34) Al-Nsour, Iyad. (2019). Planning of Marketing Communication Activities in Jordanian Pharmaceutical Companies Using the Balanced Scorecard. New Media and Mass Communication,77, 80.

35) Al-Nsour, Iyad. (2020). Effect of Sales Promotion Programs On Purchasing Behavior at Hypermarkets In Riyadh, KSA. EPRA International Journal of Economic and Business Review, 9 (5), 507–518.

36) Al-Nsour, Iyad. (2022). Measuring the Interaction among Jordanians via Facebook Network "AProposed Model for Bridging the E-Interaction Gaps "IN Model". Turkish Journal of Computer and Mathematics Education, 14 (12), 1078 – 1101.

37) Al-Nsour, Iyad., and Al-Sahli, Saud Abdullah (2024). Impact of Value on Customer Retention of Fast-Food Restaurants in Saudi Arabia. Arab Journal of Administration, 44 (3), 305-328. doi: 10.21608/aja.2023.202772.1420

38) Al-Nsour., Iyad. (2019). Planning of Marketing Communication Activities in Jordanian Pharmaceutical Companies Using the Balanced Scorecard.New Media and Mass Communication,77,63-80.

39) Alotaibi R., R., & Alharbi, M. (2024). The role of visual cues in shaping purchase intentions: Evidence from the Saudi cosmetics market. Journal of Retailing and Consumer Services, 76, 103451.

40) Al-Qahtani1, Mai Abdel Aziz., and Al-Nsour, Iyad A. (2025). Leverage Digital Advertising to Gain a Competitive Advantage for the Beauty Care Centers in Riyadh. *Pakistan Journal of Life and Social Sciences*,23 (1),1026-1046.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

41) Alqarni, S. S., Alshahrani, A. M., Alqahtani, A. S., & Alzahrani, F. A. (2023). Cosmetics use, purchasing behaviors, and associated risks among women in Saudi Arabia. Journal of Dermatology & Dermatologic Surgery, 27(2), 85–92. https://doi.org/10.1016/j.jdds.2023.01.002

42) Al-Sahli S., and Al-Nsour, I. (2022). Effects of Cash and Non-Cash Communications on Brand Awareness: An Empirical Evidence from Saudi Arabia. Journal of Asian Finance, Economics and Business, 9 (5), 507–518.

43) Alsahli, Saud Abdulla., Al-Nsour, Iyad, A., and Allahham, Mahmoud Izzat. (2025). Improving Visitor Awareness Through Marketing Literacy During Riyadh Season Events. *Lex Localis - Journal of Local Self-Government*, *23*(S4), 2511-2540. https://doi.org/10.52152/srvtb662

44) Amer, S. M., AL-Nsour, I. A., Hasnin, E. A. (2026). The Effect of Customer Experience on Saudi Passenger Satisfaction: The Moderator for Business Model. Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/ Journal of Tianjin University Science and Technology, 59 (04), 72–101).

45) Ammar, Y., A., & AL-Nsour, I., A. (2026). The Impact of Brand Personality on Customer Satisfaction: The Mediating Role of Traveler Experience. Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/ Journal of Tianjin University Science and Technology, 59(3), 212–240. https://doi.org/10.5281/zenodo.19043358

46) Ampuero, O., & Vila, N. (2006). Consumer perceptions of product packaging. Journal of Consumer Marketing, 23(2), 100–112. https://doi.org/10.1108/07363760610655032

47) Aslam, M. M. (2006). Are you selling the right colour? A cross-cultural review of colour as a marketing cue. Journal of Marketing Communications, 12(1), 15–30. https://doi.org/10.1080/13527260500247827

48) Bakhshi, S., & Gilbert, E. (2022). Visual communication and consumer perception in digital environments. Journal of Consumer Research, 49(3), 412–430.

49) Bin Khunin, Laila Khaled, and Al-Nsour, Iyad Abed Al-Fattah Al-Nsour (2024). 2024. Impact of Digital Advertising Strategies on the Competitive Advantage of SMEs in KSA. *European Journal of Business and Management Research*, 9, 2 (Apr. 2024), 91–98.

50) Bin Zaid, Y. A., AL-Nsour, I., A. (2026). Negative E-Reviews and Purchase Intention: Evidence from Saudi Fast –Food Consumers. Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/ Journal of Tianjin University Science and Technology, 59(03), 559–586. Zenodo. https://doi.org/10.5281/zenodo.19381926

51) Bleier, A., Harmeling, C. M., & Palmatier, R. W. (2019). Creating effective online customer experiences. Journal of Marketing, 83(2), 98–119. https://doi.org/10.1177/0022242918809930

52) Bloch Peter H., P. H. (1995). Seeking the ideal form: Product design and consumer response. Journal of Marketing, 59(3), 16–29.

53) Bottomley, P. A., & Doyle, J. R. (2006). The interactive effects of colors and products on perceptions of brand logo appropriateness. Marketing Theory, 6(1), 63–83. https://doi.org/10.1177/1470593106061261

54) Delgado-Ballester, E., Palazón, M., & Peláez, J. (2021). Brand aesthetics and consumer response: The moderating role of aesthetic centrality. Journal of Business Research, 123, 410–420. https://doi.org/10.1016/j.jbusres.2020.10.012

55) Dzulkifli, M. A., & Mustafar, M. F. (2013). The influence of colour on memory performance. Malaysian Journal of Medical Sciences, 20(2), 3–9.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

56) Elliot, A. J., & Maier, M. A. (2014). Color psychology: Effects of perceiving color on psychological functioning. Annual Review of Psychology, 65, 95–120. https://doi.org/10.1146/annurev-psych-010213-115035

57) Elliot, A. J., Maier, M. A., Moller, A. C., Friedman, R., & Meinhardt, J. (2007). Color and psychological functioning: The effect of red on performance attainment. Journal of Experimental Psychology, 136(1), 154–168.

58) Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2001). Atmospheric qualities of online retailing: A conceptual model and implications. Journal of Business Research, 54(2), 177–184. https://doi.org/10.1016/S0148-2963(99)00087-9

59) Garber Lawrence L., L. L., Hyatt, E. M., & Starr, R. G. (2022). The effects of color in marketing: A review and analysis. Journal of Business Research, 142, 102–115.

60) Hagtvedt Henrik, H. (2012). The impact of incomplete typeface logos on perceptions of the firm. Journal of Marketing, 76(4), 86–93.

61) Hagtvedt, H. (2020). Aesthetic design and consumer behavior. Current Opinion in Psychology, 31, 71–75. https://doi.org/10.1016/j.copsyc.2019.07.012

62) Hagtvedt, H., & Brasel, S. A. (2017). Color saturation increases perceived product size. Journal of Consumer Research, 44(2), 396–413. https://doi.org/10.1093/jcr/ucx039

63) 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.

64) Hair Joseph F. Jr., J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2019). A primer on partial least squares structural equation modeling (PLS-SEM) (2nd ed.). Sage.

65) Henseler Jörg, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135.

66) Huang, Y., Lu, J., & Ba, S. (2022). The influence of visual cues on consumer behavior in online environments. Electronic Commerce Research and Applications, 52, 101125.

67) IMARC Group. (2024). Saudi Arabia beauty and personal care market: Industry trends, share, size, growth, opportunity and forecast 2024–2030. https://www.imarcgroup.com

68) Jawabreh, O., Allahham, M., Alawneh, O. M., Habeeb, A. F. H., Almajali, W., & Al-Nsour, I. A. (2025). The impact of iot on tourist satisfaction: The mediating role of hrm capabilities in the hotel industry. *Geojournal of Tourism and Geosites*, 62(4), 2158–2169. https://doi.org/10.30892/gtg.62415-1581

69) Jonauskaite, D., Althaus, B., Dael, N., et al. (2020). Universal patterns in color–emotion associations. Journal of Experimental Psychology: General, 149(4), 657–675. https://doi.org/10.1037/xge0000685

70) Kim, J., & Sullivan, P. (2019). Emotional branding speaks to consumers' heart: The case of cosmetics products. Journal of Retailing and Consumer Services, 50, 164–171. https://doi.org/10.1016/j.jretconser.2019.04.012

71) Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. Journal of Consumer Psychology, 22(3), 332–351. https://doi.org/10.1016/j.jcps.2011.08.003

72) Kumar V., V., & Reinartz, W. (2023). Customer engagement and purchase behavior in retail environments. Journal of Marketing Research, 60(1), 1–15.

73) Labrecque Lauren I., L. I., & Milne George R., G. R. (2013). To be or not to be different: Exploration of norms and benefits of color differentiation in the marketplace. Marketing Letters, 24(2), 165–176.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

74) Labrecque, L. I., & Milne, G. R. (2012). Exciting red and competent blue: The importance of color in marketing. Journal of the Academy of Marketing Science, 40(5), 711–727. https://doi.org/10.1007/s11747-010-0245-y

75) Labrecque, L. I., Patrick, V. M., & Milne, G. R. (2013). The marketers' prismatic palette: A review of color research and future directions. Psychology & Marketing, 30(2), 187–202. https://doi.org/10.1002/mar.20597

76) Lee H., H., & Kim, J. (2022). The influence of packaging aesthetics on purchase intention: Evidence from beauty products. Journal of Retailing and Consumer Services, 68, 103022.

77) Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. Journal of Marketing, 80(6), 69–96. https://doi.org/10.1509/jm.15.0420

78) Madden Thomas J., T. J., Hewett, K., & Roth, M. S. (2000). Managing images in different cultures: A cross-national study of color meanings and preferences. Journal of International Marketing, 8(4), 90–107.

79) Malkawi, E. M., AL-Malahmeh, Z. A., Al-Nsour, I. A., & Allahham, M. (2025). The Impact of Digital Marketing on Tourist Engagement: Exploring Sustainable Development in Jordan. *Lex Localis - Journal of Local Self-Government*, *23*(S2), 294-314. https://doi.org/10.52152/

80) Mehrabian, A., & Russell, J. A. (1974). An approach to environmental psychology. MIT Press.

81) Mishra, A., Mishra, H., & Nayakankuppam, D. (2023). Visual perception and consumer decision making. Journal of Consumer Psychology, 33(2), 245–260.

82) Mordor Intelligence. (2024). Saudi Arabia cosmetics market – Growth, trends, and forecast (2024–2029). https://www.mordorintelligence.com

83) Mundel, J., Huddleston, P., & Vodermeier, M. (2018). The role of aesthetics in consumer response. Journal of Retailing and Consumer Services, 41, 69–78.

84) Naqrash, Omar Mohammed Ali, Riad, Moodhi., and Al-Nsour , Iyad A. (2025). Impact Of Social Media on Saudi Buyer Behavior in The Fashion Market. *Lex Localis - Journal of Local Self-Government*, *23*(S5), 1876-1901. https://doi.org/10.52152/801499.

85) Naqrash, Omar Mohammed Ali., Alsahli, Saud Abdulla., Al-Nsour, Iyad A., and Hasnin, Eman Abdelhameed. (2025). The Effect of Funny E-Communications on Brand Equity: A Study on Saudi Households in The Electrical Applications Market. *Lex Localis - Journal of Local Self-Government*, *23*(S4), 3749-3769. https://doi.org/10.52152/801138.

86) Orth, U. R., & Malkewitz, K. (2008). Holistic package design. Journal of Marketing, 72(3), 64–81.

87) Reimann, M., Zaichkowsky, J., Neuhaus, C., Bender, T., & Weber, B. (2010). Aesthetic package design: A behavioral, neural, and psychological investigation. Journal of Marketing, 74(5), 1–17. https://doi.org/10.1509/jmkg.74.5.1

88) Saudi Fashion Commission. (2024). Saudi Arabia fashion and beauty market report 2024. https://www.fashion.moc.gov.sa

89) Saudi Market Research Consulting. (2024). Saudi cosmetics market growth and forecast report. https://saudimarketresearchconsulting.com

90) Schifferstein, H. N., & Desmet, P. M. (2007). The effects of sensory experience on product evaluation. Journal of Product Innovation Management, 24(5), 455–469.

91) Singh, S. (2006). Impact of color on marketing. Management Decision, 44(6), 783–789.

92) Spence, C. (2018). Background colour and its impact on consumer behaviour. Food Quality and Preference, 68, 156–166. https://doi.org/10.1016/j.foodqual.2018.02.012

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 59 Issue: 04:2026
DOI: 10.5281/zenodo.20119855

93) TechSci Research. (2023). Saudi Arabia cosmetics market report. https://www.techsciresearch.com.

94) Velasco, C., & Spence, C. (2019). Multisensory packaging design: Color, shape, texture, sound, and smell. Journal of Business Research, 96, 343–353. https://doi.org/10.1016/j.jbusres.2018.06.005.

95) Vieira, V. A. (2013). Stimulus-organism-response framework: A meta-analytic review in retailing. International Journal of Retail & Distribution Management, 41(6), 468–488. https://doi.org/10.1108/IJRDM-08-2012-0076

96) Wedel, M., & Pieters, R. (2015). Visual marketing: From attention to action. Foundations and Trends in Marketing, 8(2–3), 59–168. https://doi.org/10.1561/1700000055.