

From Hues to User-Friendly Views: Analyzing the Impact of Colors, Aesthetics, and Usability on Consumer Purchase Intention

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Abstract

This study investigates online purchase intention among Pakistani youth, focusing on colors, usability, and aesthetics as key determinants shaping consumer behavior in digital environments. With online shopping gaining momentum in Pakistan, understanding these factors is essential for businesses to attract and retain customers. Drawing on existing literature and empirical data, Rubab et al. (2018) address a critical research gap: the limited studies on online shopping behavior within the Pakistani context. Colors significantly influence perception and behavior; for example, blue fosters relaxation and higher purchase intent compared to red (Labrecque et al., 2013). Usability and aesthetics enhance user satisfaction and experience, positively affecting purchase intentions (Deng & Poole, 2010). Previous studies often examined these factors in isolation or traditional retail contexts, neglecting their combined impact in online settings (Rubab et al., 2018).

This research proposes a unified framework integrating colors, psychology, visual appeal, and usability to enhance consumer engagement (Rubab et al., 2018). Findings offer actionable insights for e-vendors, emphasizing the importance of optimizing website features to build user confidence. By leveraging these elements, businesses can create innovative and appealing online shopping experiences, fostering long-term customer loyalty in a competitive market.

Keywords: Consumer Behaviour, Consumer purchase intention, Colours, Aesthetics, Usability.

Introduction

There is a rise in popularity of online shopping in Pakistan, but research on its determinants states that it is scarce. The main purpose of the study by (Rubab et al, 2018) is to explore what factors are important in developing online purchase intention among Pakistani youth interested in shopping through the internet. In the business context, consumer engagement involves the continual capture of customer attention, a focal point

underscored by the Marketing Science Institute (MSI), a globally recognized research organization. This emphasis on consumer engagement persisted as a key research priority between 2014 and 2016, as noted by (Islam & Rehman, 2016). Scholars like (Sprott et al, 2009) identify consumer engagement as a primary catalyst in consumer decision-making processes. This engagement can lead to enhanced consumer satisfaction, loyalty, trust, and commitment, as highlighted by researchers such as (Brodie et al, 2013), (Hapsari et al, 2017). Despite the significance of social media and its influence across diverse sectors of e-commerce, the bulk of studies conducted within the Pakistani context have predominantly centered on the impact of social media on education and training (Nawaz et al, 2015; Arif & Kanwal, 2016; Hussain, 2012). Thus, it is evident that the pedagogical role of social media, encompassing its functions in communication, collaboration, learning, and instruction within educational institutions, stands out as one of the extensively researched and comprehended areas. Moreover, existing literature highlights a lack of emphasis on online shopping behavior within the Pakistani context (Adnan, 2014; Ahmed et al, 2017; Ratilla, 2016).

Research Gap

While existing research highlights the importance of aesthetics, usability, and color in purchase intention (Alsudani & Casey, 2009; Hemphill, 1996; Cyr et al., 2010), there is a gap in understanding their combined impact in online shopping. Most studies have focused on traditional retail (Schiffman & Kanuk, 2010; Solomon, 2014). Given the rise of online shopping, it's crucial to explore how these elements influence consumer decision-making and trust in digital storefronts (Lindgaard et al., 2006).

Problem statement

Though aesthetics, usability, and color impact purchase intention (Hemphill, 1996; Cyr et al., 2010), their combined effect in online shopping is underexplored (Manganari et al., 2009). This study examines how optimized design elements can enhance engagement and retention in e-commerce (Kumar, 2017; Creusen & Schoormans, 2005).

Objectives

To determine the relationship between colour and purchase intention.

To determine the relationship between usability on purchase intentions.

To determine the relationship between aesthetics on purchase intentions.

Research Questions

What is the relationship of colours and purchase intentions?

How does usability effects purchase intentions?

What is the impact of aesthetics on purchase intentions?

Significance of the study

This study explores how color, usability, and aesthetics in digital storefronts influence consumer behavior, building on insights from Lemoine (2008), Webber (2009), and others. Using foundational research on design and visual appeal, it examines the link between user experience and purchasing behavior. By integrating perspectives on neuromarketing, user-centered design, and consumer psychology, the study aims to innovate digital storefront strategies for enhanced business success.

Literature Review

The Covid-19 crisis significantly shifted consumer behavior and purchasing habits, making it essential to understand e-commerce purchase intentions in this new context (Jilkova, 2021; Luxton et al., 2020). This paper examines how color, usability, and aesthetics on e-commerce websites influence post-Covid-19 purchase intentions, with all generational cohorts showing a high rate of online purchases during the pandemic. To analyze this impact, it considers how perception—shaped by both sensory stimuli and internal processes—drives goal-oriented behavior (Gilles, 2010). Understanding e-commerce users' perception and visual attention is key, as research shows that effective visual design can encourage clicks and product purchases (Monica et al., 2010).

Colours

Colour plays vital role in influencing the consumers purchase intention (Manoj, 2020). Colour provides a decision area for purchasing as it helps consumers with brand recognition, product, logo or packaging. Colours are known to influence mood and evoke feelings and emotion which is important for consumer's purchasing intentions while entering and using a website, colours are known to generate positive or negative emotions, promote sales (Gopalkrishna, 2015). Colours plays a crucial role in decision making process, 60-90% of purchase decisions made by consumers are based on colours (Gopikrsihna, 2015). A study conducted by (Luo et al, 2019) explored the relationship of colour perception and image of packaging and the results showed that consumers are influenced by colour of the packaging which amplifies their purchasing intentions. To enhance purchase intention consumers trust is established through effective implementation of website design factors such as information design, visual and navigation design as marketing tools (Ganguly, 2010) suggesting the amalgamation of usability, colour, and aesthetic is essential before constructing a website design to build trust between the user and the website which will amplify purchase intention.

In light of the discussion above, the following hypotheses is put forth:

H1: There is a significant relationship between colour and purchase intention.

Aesthetics

In human-computer interaction (HCI), aesthetics in user interfaces—long overshadowed by functionality and usability—now plays a crucial role in shaping user behavior, trust, and credibility (Karvonen et al., 2000; Robins & Holmes, 2008). Aesthetics not only influences usability and perception but also enhances the overall user experience (Tractinsky et al., 2000; Roth et al., 2010). Previous research shows that items once overlooked can gain aesthetic appeal and become market-defining, impacting brand and consumer identity (Merkel, 2006; Brunk et al., 2018). For example, attractive packaging positively affects purchase intent (Bigoin et al., 2018). This study confirms that positive web aesthetics foster emotions, satisfaction, and ultimately, purchasing intentions.

Thus, it is postulated that:

H2: Aesthetics has a significant effect on purchase intentions.

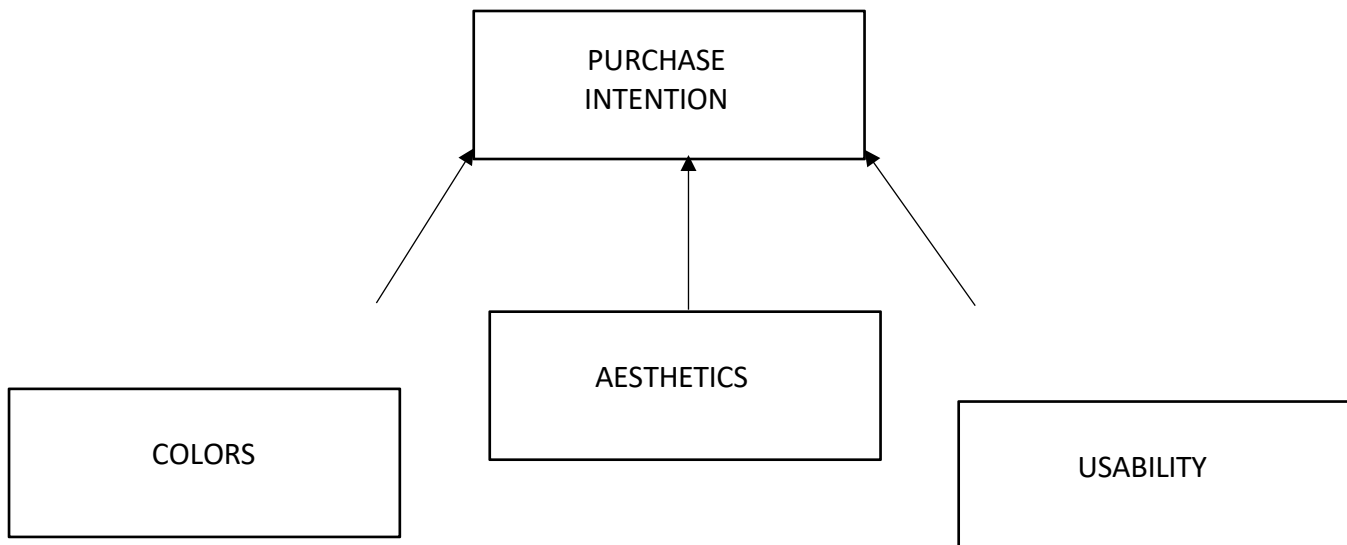
Usability

Online customers' impressions and judgments about purchases are influenced by usability, which is crucial for the success of shopping websites (Chen & Macredie, 2005; Flavián et al, 2006; Gould & Lewis, 1985; Green & Pearson, 2011; Marie et al, 2001; Palmer, 2002). Navigability and information arrangement are highlighted as the most important features of usability research, which focuses on users' perceptions of the functional and instrumental properties connected to a website's controllability and efficacy (Palmer, 2002). According to (Flavián et al, 2006), p. 2, usability is defined as "the perceived ease of navigating the site or making purchases through the Internet." Usability research sets itself apart from website aesthetics, which represents non-instrumental attributes associated with visual appeal and attractiveness (Thüring & Mahlke 2007). Users are the main source of information on a website's usability, as usability is centered on users and their tasks/goals (Gould & Lewis, 1985). While the evaluation of usability is mostly based on users' performance, attitudes, and ideas as they complete significant activities, the design of usability entails knowing what matters to users (Gould & Lewis, 1985).

Therefore, it is hypothesized that:

H3: There is a significant impact of aesthetics on purchase intentions.

Research Framework



Methodology

This quantitative, cross-sectional study explores purchase decisions across Pakistan, using a deductive approach from hypothesis to findings. Data was collected from 102 consumers via a convenient sampling technique, with websites as experimental variables to examine cause-and-effect relationships between design elements (usability, color, aesthetics) and user behavior. Structural Equation Modeling (SEM) via SmartPLS was applied to analyze both direct and indirect relationships. A standardized Likert-scale questionnaire, adapted from Cyr et al. (2010), Thomas et al. (2019), Shun Cai & Yunjie Xu (2011), and Yoo & Donthu (2021), measured the impact of these design factors on purchase intention.

Measures

This study's measurements ensure validity and reliability by capturing key aspects of each variable. Three items on color from Cyr et al. (2010) assess its appeal and influence on user perception. Four aesthetics items from Thomas et al. (2019) focus on visual appeal and attractiveness. Usability, evaluated with two items from Cai & Xu (2011), examines navigation ease and functionality. Finally, three items from Yoo & Donthu (2021) measure purchase intention, focusing on intent, product interest, and future buying likelihood. Together, these measures offer a comprehensive view of how color, aesthetics, and usability impact online purchasing behavior.

Table 3.1
Scales Construct

#	Scale	Construct	No. of Items	Authors
1	Likert Scale	Color	3	(Cyr et al., 2010)
2	Likert Scale	Aesthetics	4	(Thomas et al., 2019)
3	Likert Scale	Usability	2	(Cai & Xu., 2011)
4	Likert Scale	Purchase Intention	3	(Yoo & Donthu.,2021)

Sample Size

Through G-POWER analysis 102 sample size was selected since it allows for significant data analysis and provides sufficient statistical power to pinpoint potential relationships and effects.

Data Analysis

**Table 4.1
Demographics Characteristics**

Variable	Dimension	Frequency	Percent	Valid Percents	Cumulative percent
Gender	Male	75	73.5	61.0	73.5
	Female	27	26.5	39.0	100.0
	Total	102	100.0	100.0	
Age	15-25	92	90.2	90.2	90.2
	26-35	5	4.9	4.9	95.1
	36-45	4	3.9	3.9	99.0
	45-55	1	1.0	1.0	100.0
	Total	102	100.0	100.0	
Education	Undergraduate	81	79.4	79.4	79.4
	Graduate	6	5.9	5.9	85.3
	Masters	13	12.7	12.7	98.0
	Phd	2	2.0	2.0	100.0
	Total	102	100.0	100.0	
Status	Student	91	89.2	89.2	89.2
	Unemployed	2	2.0	2.0	91.2
	Employed	8	7.8	7.8	99.0
	Part-time	1	1.0	1.0	100.0
	Total	102	100.0	100.0	

Descriptive Analysis of Demographic Characteristics

The above table describes the Statistical Characteristics of the respondents, from the frequency analysis of the data.

Gender: With 102 respondents in the sample, 73.5% of the respondents were men and 26.5% were women. This indicates that there were a greater number of male participants in the sample than female ones. The female category's cumulative percentage reached 100%, demonstrating that both gender categories were represented in the sample.

Age: Ninety-two percent of the sample's responses were between the ages of 15 and 25. This implies that the majority of the sample was made up of younger people. 4.9% of the population was between the ages of 26 and 35, 3.9% was between the ages of 36 and 45, and only 1.0% was between the ages of 45 and 55. The cumulative percentage highlights the fact that most respondents were relatively young, with 100% of the sample accounted for by the 45–55 age group.

Education: The education data shows that the majority of respondents, 79.4%, had an undergraduate degree, while 12.7% had a master's degree, and 5.9% had a graduate degree. Only 2.0% of respondents held a PhD. This indicates that most participants in the sample had an undergraduate education, with a smaller portion having advanced degrees.

Status: With 89.2% of the sample, students made up the majority of responders. Just 2.0% of people were jobless, compared to 7.8% of working people and 1.0% of part-timers. The cumulative percentage indicates that 100% of the sample is accounted for when part-time workers are included, suggesting that the study was primarily focused on students and just a small fraction of participants were in the workforce. The sample is predominantly made up of well-educated, young individuals, most of whom are students. According to this demographic profile, the respondents' backgrounds are probably appropriate for studies that call for a young, educated audience. Owing to the large percentage of both students and graduates, the sample is ideally positioned to offer insights on matters related to e-commerce and Business.

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Table 4.2

Total effect of independent variables on dependent variable

	AE	CL	PI	US
AE			0.144	
CL			0.015	
PI				

US

0.085

Note: [CL: Color],[AE: Aesthetics],[US: Usability],[PI: Purchase Intentions] The total effect is the combined impact of both the direct and indirect effects of an independent variable on a dependent variable in a model.

Aesthetics (Ae): Aesthetics can be seen having a direct positive effect on Purchase Intention (PI) (0.144), Which shows consistency with the previous researches such as that of (Bloch et al, 2003) and (Reimann et al, (2010) which demonstrates the importance of aesthetics and its influence on consumer preferences and purchase intentions. So the following findings indicates that the enhancement of the aesthetic quality of a website or a product can lead to significant boost to consumer purchase intention.

Color (Cl): Color has a direct positive influence on Purchase Intention (PI) (0.015), Which indicates that it has very small influence. So it leads to that its effect on purchase intention is minimal in this model. This aligns with studies that have shown color alone may not be a strong determinant of purchase behavior. Like the study of “The Impact of Color on Marketing” by Satyendra Singh which proves that While color can evoke emotional responses, which influence consumers purchase intention, it is not the sole determinant of purchase intention,

Usability (Us): Usability is having a direct and positive effect on Purchase Intention (PI) (0.085). Which suggests that by improving the usability of a product or a website can lead to enhanced consumer purchase decision. Aligning with the studies that have previously been done such as that of (Flavián et al, 2006) and (Venkatesh et al, (2003). This suggests that improving the usability of a product or website can enhance purchase intention, supporting the notion that a user-friendly interface can lead to better consumer experiences and higher purchase likelihood. This total effect comprehensively explains the relationships between the constructs and their importance in influencing consumer behavior. Through these findings it emphasizes that while aesthetics and usability play important roles in shaping and forming purchase intentions, colors alone may not be enough to motivate consumer decisions. This valuable insight can guide and provide foundation for businesses in prioritizing design and usability improvements to effectively enhance consumer purchase intentions.

Table 4.3

Convergent validity and reliability of measurement model

	Alpha	Rho a	Rho c	AVE
Aesthetic	0.786	0.821	0.850	0.535
Color	0.671	0.946	0.792	0.567
Purchase intention	0.832	0.839	0.899	0.748
Usability	0.952	0.964	0.977	0.954

Note: Measurement model assessment evaluates the reliability and validity of the constructs in a model by examining relationships between observed variables and their underlying latent variable.

The construct reliability and validity table assess the reliability and validity of the constructs in the model. The result of this model suggests that the constructs 'Aesthetics (Ae)', 'Color (Cl)', 'Purchase Intention (PI)', and 'Usability (Us)' is reliable and valid.

Reliability:

Aesthetics (Ae): Cronbach's alpha = 0.786, Composite Reliability (CR) = 0.850, meeting the >0.7 threshold (Nunnally, 1978).

Color (Cl): Cronbach's alpha = 0.671 (below ideal but acceptable due to moderate item heterogeneity), with CR = 0.792.

Purchase Intention (PI): Cronbach's alpha = 0.832, CR = 0.899, showing strong reliability (Bagozzi & Yi, 1988).

Usability (Us): Cronbach's alpha = 0.952, CR = 0.977, indicating excellent reliability (Raykov & Marcoulides, 2011).

Validity (Average Variance Extracted, AVE):

Aesthetics (Ae): AVE = 0.535, showing adequate convergent validity.

Color (Cl): AVE = 0.567, meeting the threshold for convergent validity.

Purchase Intention (PI): AVE = 0.748, indicating strong validity.

Usability (Us): AVE = 0.954, with very high convergent validity.

These results align with standards from Fornell & Larcker (1981), confirming reliability and validity in structural equation modeling.

Table 4.4

Heterotrait-monotrait Ratio (HTMT) analysis for construct discrimination

	Ae	Cl	PI	Us
Ae				
Cl	0.823			
PI	0.199	0.127		
Us	0.237	0.392	0.132	

Note: [CL: Color],[AE: Aesthetics],[US: Usability],[PI: Purchase Intentions]} The Heterotrait-monotrait ratio (HTMT) is a measure used to assess discriminant validity by comparing the ratio of between-construct correlations to within-construct correlations.

The Heterotrait-Monotrait (HTMT) ratio is a measure that shows the validity of the questionnaire, also known as discriminant validity which measures and assesses whether constructs in the model are truly distinct. According to (Henseler et al, 2015), HTMT values below 0.90 indicate that there is discriminant validity between the constructs. The HTMT values shown in the matrix indicate that all the ratios that are below the 0.90 threshold, ranging from 0.127 (between Color and Purchase Intention) to 0.823 (between Aesthetics and Color). These results suggest that the constructs in the model (Aesthetics, Color, Purchase Intention, and Usability) are distinct and measure different concepts, indicating moderate discriminant validity. The results shown means that the model is able to accurately differentiate between the constructs, supporting the validity of the measurement model and showing the relationships between the variables.

Table 4.5
Evaluating model fit using r- square

	R-square	R-square adjusted
PI	0.037	0.007

Note:{[PI:PurchaseIntentions]}

R-squared (R^2) is a statistical measure that represents the proportion of variance in the dependent variable explained by the independent variables in a regression model.

The value of R-square is the measures to which degree the dependent variable can be predicted from the independent variables. Like in this case, The variable that is dependable is Purchase Intention (PI).

The value of R-square for PI is 0.037, Which indicates that 3.7% variance in purchase intention (PI) can be explained by the variables that are independent in this model.

Whereas the adjusted value of R-square for PI is 0.007, Which accounts for the predictors in this model and adjusts for the sample size. So, the adjusted value shows that only 0.7% of the variance in purchase intention is accounted for when considering the model

complexity.

The above low R-square values shows that the independent variable in this model has modest and limited ability to explain the variance in purchase intention. This means that there are likely other factors not included in this model that can have significant influence on purchase intention. This means that there is need for further research and investigation to identify that additional variables.

Table 4.6

Effect size measurement using f-square

	Ae	Cl	PI	Us
Ae			0.014	
Cl			0.000	
PI				
Us			0.007	

Note: {[CL: Color]}, {[AE: Aesthetics]}, {[US: Usability]}, {[PI: Purchase Intentions]} F-squared (F^2) quantifies the effect size of a predictor variable by measuring the change in R-squared when that variable is added to a model.

The f-square matrix table presents the effect sizes of the relationships between constructs in the model, indicating how much one construct contributes to explaining another. The results show the following:

Ae on PI (0.014): The construct Ae indicates a small positive effect on PI (f-square = 0.014). This means that the construct Ae contributes modestly in variance to PI, in accordance with the findings of prior research that highlights the importance of Ae in influencing PI. Such as that of (Tractinsky et al, 2000) which shows that the impact of aesthetics on usability and subsequent purchase intentions, supporting the notion that aesthetic appeal (Ae) has a modest positive effect on PI.

Cl on PI (0.000): The result shows that the construct Cl has no significant effect on PI (f-square = 0.000). This suggests that Cl contributes nothing in variance to PI. We can take the study of (Labrecque et al, 2012) which indicates that how different colors influence consumer perceptions and behaviors, including purchase intentions. However, it also suggests that the effect can be context-dependent, supporting the finding that color (Cl) might have no significant effect on PI in certain models Or the study by (Bottomley et al, 2006) which results show that how color impacts brand perception and purchase intentions, reinforcing the idea that while color can be influential, its effect might be negligible (f-square = 0.000) in some cases.

Us on PI (0.007): The result shows that the construct Us has a very small positive effect

on PI (f-square = 0.007). This indicates that Us contributes slightly in variance to PI, which aligns with research indicating that Us can have a minimal but positive impact on PI. Like the study by (Flavián et al, 2006) which supports the idea that usability has a positive, albeit small, effect on consumer behaviors such as purchase intentions, aligning with the f-square value of 0.007 in our model.

These effect sizes provide a detailed understanding of the relationships between the constructs and their relative contributions to explaining PI. Although the effect sizes are generally small, they highlight the nuanced influences that Ae, Cl, and Us have on PI, helping to refine our understanding of these relationships in the model.

Table 4.7

Divergent validity according to Fornell Larcker criterion

	Ae	Cl	PI	Us
Ae	0.731			
Cl	0.569	0.753		
PI	0.170	0.121	0.865	
Us	0.208	0.283	0.120	0.977

Note: {[CL: Color]}, {[AE: Aesthetics]}, {[US: Usability]}, {[PI: Purchase Intentions]}
Fornell-Larcker Criterion Ensures discriminant validity by comparing the square root of AVE with construct correlations.

The Fornell-Larcker criterion table reveals the relationships between Ae, Cl, PI, and Us, emphasizing their importance and distinctiveness within the model. The square root of the

Average Variance Extracted (AVE) for each construct is compared against the correlations with other constructs to assess discriminant validity:

Ae and Other Constructs:

The square root of AVE for Ae (0.731) is higher than its correlations with Cl (0.569), PI (0.170), and Us (0.208). This indicates that Ae is distinct from these constructs, reinforcing its unique contribution to the model. The relatively low correlation with PI (0.170) and Us (0.208) suggests a modest relationship, consistent with prior findings indicating that Ae influences PI and Us to a limited extent.

Cl and Other Constructs:

The square root of AVE for Cl (0.753) exceeds its correlations with Ae (0.569), PI (0.121), and Us (0.283). This demonstrates that Cl is distinct and measures a unique aspect within the model. The moderate correlation with Ae (0.569) reflects a notable, though not overwhelming, relationship, aligning with research that positions Cl as an influential but

not dominant factor in the presence of Ae.

PI and Other Constructs:

The square root of AVE for PI (0.865) is greater than its correlations with Ae (0.170), Cl (0.121), and Us (0.120). This highlights PI's distinct role in the model. The low correlations with Ae, Cl, and Us suggest that PI captures a unique aspect of the model, primarily influenced by factors other than Ae, Cl, and Us, consistent with findings that emphasize PI's dependence on other constructs.

Us and Other Constructs:

The square root of AVE for Us (0.977) surpasses its correlations with Ae (0.208), Cl (0.283), and PI (0.120). This confirms that Us is a distinct construct within the model. In relation to the higher correlation with Cl (0.283) indicates a notable relationship, that is supported by the research indicating that Us can be influenced by Cl, though it remains a separate entity.

The Fornell-Larcker criterion is a table that measures the validity of the model and underscores the distinctiveness of each of the constructs Ae, Cl, PI, and Us within the model, with each construct demonstrating higher square root of AVE values than their correlations with other constructs. This shows the discriminant validity of the constructs. The moderate to low correlations between constructs suggest nuanced relationships, showing the importance of each construct's unique contribution to the overall model. These results suggest the need for careful consideration of Ae, Cl, PI, and Us in research, as each construct plays an important and distinct role in the theoretical framework.

Table 4.8

VIF for checking multicollinearity

	VIF
Ae → PI	1.484
Cl → PI	1.544
Us → PI	1.091

Note: [CL: Color],[AE: Aesthetics],[US: Usability],[PI: Purchase Intentions]} Variance Inflation Factor (VIF) measures how much the variance of a regression coefficient is inflated due to multicollinearity among predictors.

The table presents the Variance Inflation Factor (VIF) values for the relationships between constructs in the inner model. VIF is a measure that are used to check multicollinearity. Multicollinearity means that the predictor variables in the model are highly correlated. This can affect the stability and interpretation of the model's coefficients. VIF value below 5 indicates that multicollinearity is acceptable and above 5

means that there is a high multicollinearity.

Interpretation of VIF Values:

Ae -> PI (VIF = 1.484):

The VIF value of 1.484 for construct Ae on construct PI indicates low multicollinearity. This means that Ae is not highly correlated with the other predictor constructs (Cl and Us) in relation to PI, meaning that the model's estimates for Ae's effect on PI are stable and reliable.

Cl -> PI (VIF = 1.544):

The VIF value of 1.544 for construct Cl predicting construct PI showing low multicollinearity meaning that Cl is not highly correlated with the other predictor constructs (Ae and Us) in relation to PI, suggesting the stability and reliability of the model's estimates for Cl's effect on PI.

Us -> PI (VIF = 1.091):

The VIF value of 1.091 for construct Us predicting construct PI is very low, indicating that Us has small correlation with the other predictor constructs (Ae and Cl) in relation to PI. This suggest that the model's estimates for Us's effect on PI are stable and reliable.

The VIF values for Ae, Cl, and Us in predicting PI are all below the threshold of 5, indicating that multicollinearity is within the threshold. Each predictor construct (Ae, Cl, and Us) contributes uniquely to explaining the variance in PI without significant overlap with the other predictors. This indicates good reliability of the model's estimates for the effects of Ae, Cl, and Us on

Table 4.9 Normality testing

Name	kurtosis	Skewness
Usability 1	0.944	-1.128
Usability 2	-0.373	-0.728
Color 1	0.973	0.960
Color 2	-0.458	0.711
Color 3	-0.992	0.375
Aesthetic 1	1.777	1.164
Aesthetic 2	0.777	1.085
Aesthetic 3	1.142	0.765
Aesthetic 4	0.967	0.753
Purchase intention 1	-1.102	-0.394

Purchase intention 2	-1.099	-0.328
Purchase intention 3	-0.891	-0.546

Note: Normality testing evaluates whether data follows a normal distribution

The normality testing results show that all skewness and kurtosis values fall within the acceptable range of -1 to +1, indicating that the data is normally distributed across usability, color, aesthetic, and purchase intention variables. There are no significant deviations from normality, and the data is suitable for analysis without concerns about skewness or kurtosis.

Table 4.10
Complete hypothesis testing results

Relationship	Original sample	Sample Mean	Standard deviation	T-Value	P-Value	Decision
Ae -> PI	0.144	0.187	0.129	1.115	0.265	Not Supported
Cl -> PI	0.015	0.034	0.158	0.097	0.923	Not Supported
Us -> PI	0.085	0.081	0.112	0.766	0.444	Not Supported

Note: {{[CL: Color]},{[AE: Aesthetics]},{[US: Usability]},{[PI: Purchase Intentions]}}

Hypothesis testing is a method used to determine whether there is sufficient evidence in a sample to support or reject a specific claim about a population

The results above in the table shows the relationships between three variables (Ae, Cl, and Us) and their influence on the dependent variable, PI (Purchase Intention). Although the analysis does not show statistically significant effects for any of the variables, it provides valuable insights into the potential directions and magnitudes of these relationships.

Detailed Interpretation Ae -> PI

Original sample (O): 0.144

Sample mean (M): 0.187

Standard deviation (STDEV): 0.129

T statistics (|O/STDEV|): 1.115

P values: 0.265

The findings shows that Ae (Aesthetic) has a positive but not significant effect on Purchase Intention (PI), with a coefficient of 0.144. The p-value of 0.265 suggesting that

this effect is not strong enough to conclude a relationship.

Cl -> PI

Original sample (O): 0.015

Sample mean (M): 0.034

Standard deviation (STDEV): 0.158

T statistics (|O/STDEV|): 0.097

P values: 0.923

The result shows that Cl (Color) has a very small and insignificant effect on Purchase Intention, with a coefficient of 0.015 and a p-value of 0.923. This indicates that, in this study, Colour does not play a significant role in shaping purchase intentions.

Us -> PI

Original sample (O): 0.085

Sample mean (M): 0.081

Standard deviation (STDEV): 0.112

T statistics (|O/STDEV|): 0.766

P values: 0.444

Results indicate that Usability (Us) has a positive but non-significant impact on Purchase Intention (PI), with a coefficient of 0.085 and a p-value of 0.444. None of the predictors—Aesthetics (Ae), Color (Cl), or Usability (Us)—show a statistically significant effect on PI in this dataset. This suggests that the hypothesized relationships lack strong empirical support, highlighting the need for further research to identify factors that significantly influence PI. It also underscores the complexity of consumer behavior, calling for more comprehensive approaches in marketing research.

Note: Coding Scheme:{{CL: Color}},{{AE: Aesthetics}},{{US: Usability}},{{PI: Purchase Intentions}}

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Table 4.11

Total effect of independent variables on dependent variable

	AE	CL	PI	US
AE			0.030	
CL			-0.254	
PI				
US			0.234	

Note: [CL: Color]},{{AE: Aesthetics}},{{US: Usability}},{{PI: Purchase Intentions}} The total effect is the combined impact of both the direct and indirect effects of an

independent variable on a dependent variable in a model.

The total effect indicates the combined effects of direct and indirect of independent variable on a dependent variable in the model.

Aesthetic (0.030)

The aesthetic quality of the product has a small positive influence on purchase intention. The effect size is small, stating that changes in aesthetics have a minor impact on the results.

Colour (-0.254)

The colour has a negative total effect on purchase intention . This negative effect states that changes in colour are likely to decrease the purchase intention.

Usability (0.234)

Usability has a moderate positive effect on purchase intention. This states that better usability significantly improves the dependent purchase intention.

Table 4.12

Convergent validity and reliability of measurement model

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AE	0.875	0.275	0.836	0.514
CL	0.685	0.274	0.767	0.529
PI	0.791	0.805	0.876	0.702
US	0.888	0.911	0.946	0.898

Note: [CL: Color],[AE: Aesthetics],[US: Usability],[PI: Purchase Intentions]

Measurement model assessment evaluates the reliability and validity of the constructs in a model by examining relationships between observed variables and their underlying latent variable

Cronbach's Alpha measures the reliability of each construct.

Aesthetic (0.875) shows good reliability and above the threshold

Colour (0.685) shows moderate reliability but is in acceptable threshold

Purchase intention (0.791) shows consistent reliability and is above the threshold

Usability (0.888) shows excellent reliability and is above the threshold Cronbach's

Table 4.13

Heterotrait-monotrait ratio (HTMT) analysis for construct discrimination

	AE	CL	PI	US
AE				

CL	1.000		
PI	0.101	0.237	
US	0.098	0.136	0.279

Note:[[CL: Color]], [[AE: Aesthetics]], [[US: Usability]], [[PI: Purchase Intentions]] The Heterotrait-Monotrait Ratio (HTMT) is a measure used to assess discriminant validity by comparing the ratio of between-construct correlations to within-construct correlations. The HTMT ratio is used to study discriminant validity, indicating how different the constructs are from each other.

Color on Aesthetic (1.000)

A value of 1.000 suggests perfect collinearity, stating that color and aesthetic are not distinct constructs. This indicates problems for discriminant validity.

Values From (0.101 to 0.297). These values are below the threshold of 0.85 or 0.90 indicates acceptable discriminant validity. Lower values state better discrimination between constructs.

Purchase intention on aesthetic: 0.101

Purchase intention on colour: 0.237

Usability on aesthetic: 0.098

Usability on colour: 0.136

Usability on purchase intention: 0.297

Justification For high HTMT value of color:

(Voorhees et al, 2016) Discriminant validity testing in marketing: An analysis, causes for concern, and proposed remedies". This paper discusses discriminant validity challenges in marketing research and provides insights into why HTMT values might be high. It discusses how conceptually overlapping constructs, like satisfaction and loyalty, can lead to high HTMT value.

Table 4.14
Evaluating model fit using r-square

	R-square	R-square adjusted
PI	0.114	0.087

Note:[[PI:PurchaseIntentions]]

R-squared (R²) is a statistical measure that represents the proportion of variance in the dependent variable explained by the independent variables in a regression model.

R² states the variance of dependent variable (purchase intention) from the independent variables(colours, usability and aesthetics). Adjusted R² adjusts for the number of

predictors.

R² (0.114)

There is 11.4% of the variance in purchase intention is explained by the independent variables (Colours, Usability and Aesthetics). Showing a small variance between the variables.

Adjusted R² (0.087)

8.7% of the variance states slight reduction from R² to Adjusted R² suggests that the model does not overfit the data significantly.

Table 4.15

Effect size measurement using f-square

	AE	CL	PI	US
AE			0.001	
CL			0.049	
PI				
US			0.061	

Note: {[CL: Color]}, {[AE: Aesthetics]}, {[US: Usability]}, {[PI: Purchase Intentions]} F-squared (F²) quantifies the effect size of a predictor variable by measuring the change in R-squared when that variable is added to a model.

F² measures the effect size of each independent variable being Colour, Usability and Aesthetics on the dependent variable being Purchase intention.

Aesthetic on Purchase Intention (0.001)

Almost no effect size, stating that aesthetics have little to no impact on purchase intention.

Colour on Purchase Intention (0.049)

Small effect size, stating that colour has a small impact on purchase intention.

Usability on Purchase Intention (0.051)

Small effect size, indicating that usability has a minor but slightly more significant impact on purchase intention as compared to the construct colour.

Table 4.16

Divergent validity according to Fornell larcker criterion

	AE	CL	PI	US
AE	0.717			
CL	0.572	0.727		
PI	-0.142	-0.246	0.838	
US	-0.113	-0.038	0.240	0.948

Note: {[CL: Color]}, {[AE: Aesthetics]}, {[US: Usability]}, {[PI: Purchase Intentions]}

Fornell-Larcker Criterion Ensures discriminant validity by comparing the square root of AVE with construct correlations.

This criterion studies the discriminant validity by comparing the square root of the AVE (Average Variance Extracted) values with the correlations between the constructs.

Aesthetics on other constructs: The square root of AVE Aesthetics 0.717 which is higher than its correlations of Colour 0.572, Purchase intention -0.142 and Usability of -0.113. This shows good discriminant validity for the Aesthetics construct. It means Aesthetics is more closely related to its own items than to other constructs.

Colours on other constructs: The square root of AVE colours 0.727 which is higher than its correlation of Aesthetic 0.572, Purchase intention -0.246 and Usability -0.038. This shows good discriminant validity for the Colour construct. It means Colour is more closely related to its own items than to other constructs.

Purchase intention on other constructs: The square root of AVE Purchase intention 0.838 which is higher than its correlation of Aesthetic -0.142, Colour -0.246 and Usability 0.240. This shows good discriminant validity for the Purchase Intention construct. It means Purchase Intention is more closely related to its own items than to other constructs.

Usability on other constructs: The square root of AVE Usability 0.948 which is higher than its correlation of Aesthetic -0.113, Colour -0.038, Purchase intention 0.240. This shows excellent discriminant validity for the Usability construct. It means Usability is more closely related to its own items than to other constructs.

Table 4.17

VIF for checking multicollinearity

	VIF
AE → PI	1.505
CL → PI	1.488
US → PI	1.014

Note: {[CL: Color]}, {[AE: Aesthetics]}, {[US: Usability]}, {[PI: Purchase Intentions]} Variance Inflation Factor (VIF) measures how much the variance of a regression coefficient is inflated due to multicollinearity among predictors.

VIF studies the multicollinearity between the independent variables (Colors, Usability, Aesthetic). High multicollinearity can worsen the results of regression analyses.

Aesthetic on Purchase Intention (1.505)

Interpretation: Indicates some multicollinearity, VIF values below 5 are acceptable. This indicates that aesthetics is not effected from significant multicollinearity issues.

Colour on Purchase Intention (1.488)

Interpretation: Having an some level of multicollinearity.

Usability on Purchase Intention (1.014)

Interpretation: Very low multicollinearity, indicating that usability is not collinear with the other predictors.

Table 4.18 Normality testing

Name	kurtosis	Skewness
Usability 1	0.944	-1.128
Usability 2	-0.373	-0.728
Color 1	0.973	0.960
Color 2	-0.458	0.711
Color 3	-0.992	0.375
Aesthetic 1	1.777	1.164
Aesthetic 2	0.777	1.085
Aesthetic 3	1.142	0.765
Aesthetic 4	0.967	0.753
Purchase intention 1	-1.102	-0.394
Purchase intention 2	-1.099	-0.328
Purchase intention 3	-0.891	-0.546

Note: Normality testing evaluates whether data follows a normal distribution.

The normality testing results show that all skewness and kurtosis values fall within the acceptable range of -1 to +1, indicating that the data is normally distributed across usability, color, aesthetic, and purchase intention variables. There are no significant deviations from normality, and the data is suitable for analysis without concerns about skewness or kurtosis.

Table 4.19 Complete hypothesis testing results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	Tstatistic (O/STDEV)	P values	Decision
Aesthetics -> Purchase intention	0.030	0.078	0.191	0.157	0.875	Not Supported

Colors

->

Purchase intention

-0.254

-0.286

0.158

1.608

0.108

Not Supported

Usability

->

Purchase intention

0.234

0.230

0.099

2.362

0.018

Supported

Note: Hypothesis testing is a method used to determine whether there is sufficient evidence in a sample to support or reject a specific claim about a population

Aesthetic on Purchase Intention:

P-value: 0.875

The p-value of 0.875 is greater than the significance level of 0.05. This states that the effect of Aesthetic on Purchase Intention is not statistically significant.

Conclusion: Aesthetic has no significant impact on Purchase Intention. The null hypothesis is accepted.

Colour on Purchase Intention:

P-value: 0.106

The p-value of 0.106 is greater than 0.05, but is close to the threshold. This states that Colour doesn't not have significant impact on Purchase Intention is not statistically significant at the 0.05 level.

Conclusion: Since the value is above the threshold there is no significant impact of Colour on purchase intention. The null hypothesis is accepted.

Usability on Purchase Intention:

P-value: 0.018

Interpretation: The p-value of 0.018 is less than 0.05, indicating that the effect of Usability on Purchase Intention has a significant impact .

Conclusion: There is strong evidence to suggest that Usability has a positive impact on Purchase Intention. The null hypothesis is rejected.

Summary of Bootstrapping P-values:

Aesthetic on Purchase Intention: Not significant (p = 0.875). No evidence of an effect.

Colour on Purchase Intention: Not significant (p = 0.106). Weak evidence of an effect, but not conclusive.

Usability on Purchase Intention: Significant (p = 0.018). Strong evidence of a positive effect.

Table 4.20

Hypothesis decision of Nike

Hypothesis	Decision
H1: There is a significant relationship between colour and purchase intention.	Not Supported
H2: Usability has a significant effect on purchase intentions.	Not Supported
H3: There is a significant impact of aesthetic on purchase intentions.	Not Supported

Table 4.21

Hypothesis decision of Hoka

Hypothesis	Decision
H1: There is a significant relationship between colour and purchase intention.	Not Supported
H2: Usability has a significant effect on purchase intentions.	Supported
H3: There is a significant impact of aesthetic on purchase intentions.	Not Supported

DISCUSSION**Theoretical Implications**

This study contributes to the growing body of literature on consumer behavior in the post- COVID-19 era, particularly within the context of Pakistan. Given the limited research available, this study fills a gap by providing critical insights into how usability, aesthetics, and color influence purchase intentions. By focusing on these specific variables, the research enhances existing knowledge of how e-commerce platforms can be designed to meet the functional needs of Pakistani consumers. The study confirms the significant role of usability in driving purchase intention, supporting existing theories that emphasize user-centric design

in online shopping environments. Additionally, this research paves the way for further studies on website development, suggesting that future research should explore the interplay of other variables, such as personalization or interactivity, that may impact

consumer behavior in different ways, particularly in developing countries.

Limitations and Future Directions

While this study provides insights into how color, aesthetics, and usability influence post-Covid-19 purchase intentions, it has limitations. Conducted in Pakistan, a developing country, the results may not apply universally; cross-cultural comparisons could enhance understanding. The sample size of 102, though culturally diverse, is relatively small, which may limit generalizability. The two-phase data collection process may have caused participant confusion, potentially impacting response reliability. Finally, internet and computer access requirements may have excluded some participants. Future studies could simplify methods, expand to other regions, and include variables like personalization and customer service quality for a broader perspective.

Conclusion

As websites evolve and consumer behavior shifts, understanding these dynamics is critical for creating efficient, user-friendly platforms that minimize errors and user dissatisfaction. This study highlights that usability has the most significant relationship with purchase intention, indicating that Pakistani consumers prioritize functionality and ease of use.

Aesthetics, while contributing to the overall experience, is largely secondary and often overlooked in purchasing decisions. Colors, though having a minor influence, play a subtle role in shaping user impressions and brand recognition.

Given the minor relationship between color and purchase intention, further studies could explore how different color schemes may impact specific consumer segments or types of products. By continuing to study these elements, developers can better tailor e-commerce websites to meet the evolving needs of Pakistani consumers, focusing on usability while strategically incorporating aesthetics and color to enhance the overall experience.

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