

## Determinants of Online Impulse Buying Behavior: Personalized Product Recommendations, Aesthetic Appeal, Continuous Trust, and Online Review Stimuli

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<p><b>Çevrimiçi Plansız Satın Alma Davranışının Belirleyicileri: Kişiselleştirilmiş Ürün Önerileri, Estetik Çekicilik, Sürekli Güven ve Çevrimiçi Yorum Uyaraları</b></p>	<p><b>Determinants of Online Impulse Buying Behavior: Personalized Product Recommendations, Aesthetic Appeal, Continuous Trust, and Online Review Stimuli</b></p>
<p><b>Özet</b></p> <p><i>Bu çalışmanın amacı, kişiselleştirilmiş ürün önerilerinin kalitesi, estetik çekicilik, sürekli güven ve çevrimiçi yorum uyaralarının çevrimiçi plansız satın alma davranışının üzerindeki etkilerini incelemektir. Araştırma verileri, daha önce çevrimiçi alışveriş deneyimi bulunan 403 tüketiciden çevrimiçi anket yöntemiyle toplanmıştır. Önerilen araştırma modeli, yapısal eşitlik modellemesi kullanılarak test edilmiştir. Elde edilen bulgular, kişiselleştirilmiş ürün önerilerinin kalitesi ile estetik çekiciliğin çevrimiçi plansız satın alma davranışının üzerinde anlamlı ve pozitif bir etkiye sahip olduğunu ortaya koymaktadır. Buna karşılık, sürekli güven ve çevrimiçi yorum uyaralarının plansız satın alma davranışının üzerinde anlamlı bir etkisi bulunmamıştır. Araştırma sonuçları, çevrimiçi plansız satın alma davranışının ağırlıklı olarak duygusal ve deneyimsel uyaralar tarafından şekillendığını, bilişsel ve değerlendirmeye dayalı mekanizmaların ise bu davranış üzerinde sınırlı bir role sahip olduğunu göstermektedir</i></p>	<p><b>Abstract</b></p> <p><i>The purpose of this study is to examine the effects of the quality of personalized product recommendations, aesthetic appeal, continuous trust, and online review stimuli on online impulse buying behavior. The research data were collected through an online survey from 403 consumers with prior online shopping experience. The proposed research model was tested using structural equation modeling. The findings reveal that the quality of personalized product recommendations and aesthetic appeal have a significant and positive effect on online impulse buying behavior. In contrast, continuous trust and online review stimuli do not have a significant effect on impulse buying behavior. The results further indicate that online impulse buying behavior is predominantly shaped by emotional and experiential stimuli, whereas cognitive and evaluative mechanisms play a limited role in influencing this behavior.</i></p>
<p><b>Anahtar Kelimeler:</b> Çevrimiçi Plansız Satın Alma, Kişiselleştirilmiş Ürün Önerileri, Estetik Çekicilik, Sürekli Güven, Çevrimiçi</p>	<p><b>Keywords:</b> Online Impulse Buying Behavior, Personalized Product Recommendations, Aesthetic Appeal, Continuous Trust, Online</p>

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Yorum Uyaraları	Review Stimuli
<b>JEL Kodları:</b> M31, D12, L81	<b>JEL Codes:</b> M31, D12, L81

**Araştırma****ve Yayın****Etiği****Beyanı**

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## 1. Introduction

With the acceleration of digitalization, online shopping has fundamentally transformed consumers' purchasing behaviors; this transformation has particularly facilitated the prevalence of online impulse buying behavior. Compared to traditional shopping environments, online platforms expose consumers to a greater intensity of visual stimuli, personalized content, and instant purchasing opportunities. This environment makes it easier for consumers to make unplanned purchasing decisions driven by sudden and emotional responses (Verhagen ve Van Dolen, 2011; Lai, 2017). Consequently, online impulse buying has become an increasingly prominent research topic for both academics and practitioners.

Although the literature contains numerous studies aiming to explain online impulse buying behavior, these studies largely focus on a limited set of variables, such as hedonic motivations, perceived value, price promotions, and individual characteristics. However, the dynamic nature of digital shopping environments suggests that consumers' decision-making processes are shaped not only by individual factors but also by platform-based technological and design-related elements. In this context, it is important to examine the effects of factors such as aesthetic appeal, personalized product recommendations, online reviews, and trust on impulse buying behavior within a holistic framework.

Personalized product recommendations, in particular, reduce search costs and accelerate the purchasing process by delivering content tailored to consumers' past behaviors and preferences (Pu et al., 2012; Choi et al., 2011).

Similarly, aesthetic appeal enhances consumers' emotional responses through the visual design of online stores and can positively influence purchase intentions (Lavie ve Tractinsky, 2004; Wang et al., 2010). However, the role of factors that require more cognitively oriented evaluations—such as online reviews and continuous trust—in impulse buying behavior has not been clearly established in the literature. While some studies suggest that these variables significantly influence impulse buying (Chen et al., 2019; Zhang et al., 2013), others report no significant effects (Effendi et al., 2020; Pambagyo ve Karnawati, 2020). Most existing studies examine these variables in isolation or in limited combinations and do not comparatively investigate aesthetic, technological, and trust-based factors within a single integrated model. Moreover, the limited number of empirical studies that comparatively examine the relative effects of emotional–experiential stimuli and cognitive–evaluative factors in online impulse buying behavior creates theoretical ambiguity regarding the conditions under which each mechanism becomes dominant. Consequently, the specific conditions and underlying processes that lead to the emergence of online impulse buying remain insufficiently clarified.

The primary objective of this study is to examine the effects of the quality of personalized product recommendations, aesthetic appeal, continuous trust, and online review stimuli on online impulse buying behavior within a comprehensive research model. To this end, the study aims to test the relative impacts of these variables on online impulse buying behavior using structural equation modeling. In doing so, the study seeks to address existing gaps in the literature and to offer strategically valuable insights for e-commerce platforms.

## 2. Theoretical Background and Hypothesis Development

In examining the factors influencing online impulse buying behavior, this study draws on Dual Process Theory. According to this theory, human thinking and reasoning are derived from two distinct systems or processes. Processes referred to as Type 1 (System 1) are fast, automatic, unconscious, and associative, and require minimal working memory resources, whereas Type 2 (System 2) processes are slow, controlled, sequential, and conscious, impose a heavy load on working memory, and are closely related to individual differences in intelligence (Barrouillet, 2011). In this context, factors such as aesthetic appeal and personalized product recommendations facilitate consumers' rapid and intuitive reactions, thereby fostering online impulse buying behavior. In contrast, factors that rely on evaluation and information processing—such as continuous trust and online reviews—are primarily associated with System 2 and require more deliberate decision-making processes.

Online impulse buying behavior is defined as consumers' unplanned and spontaneous purchasing in a digital environment with the aim of obtaining immediate gratification (Lai, 2017). When engaging in impulse buying, consumers do not devote extensive cognitive effort to considering why or for what purpose they purchase products or services. In such situations, individuals may experience a sense of loss of control over their purchasing behavior and may pay limited attention to the potential consequences of their actions (Verhagen ve Van Dolen, 2011). Consumers are exposed to a multitude of stimuli in digital environments, where product images, advertisements, and various attention-grabbing price cues significantly influence impulse buying behavior (Madhavaram ve Laverie, 2004).

Personalized product recommendations emerge as a technology that proactively presents items aligned with consumers' interests (Pu et al., 2012). Through the use of these technologies, consumers' product search efforts are reduced, and the rapid presentation of relevant recommendations contributes to increased customer loyalty and cross-selling opportunities (Choi et al., 2011). Personalized recommendations function similarly to word-of-mouth endorsements and foster individuals' continued use of technology (Kautish et al., 2023). Prior research indicates that personalized recommendations tailored to consumers' individual preferences receive greater acceptance and higher click-through rates than random recommendations (de Pechpeyrou, 2009; Senecal ve Nantel, 2004). In this regard, personalized recommendation systems not only provide cognitive benefits but also shape consumers' emotional responses and purchasing behaviors. This effect becomes particularly salient in digital environments. Personalized product recommendations delivered through digital platforms enhance perceived usefulness and ease of use via data-driven recommendation algorithms, thereby increasing the likelihood of impulse buying (Fadilah et al., 2025). Personalized recommendation systems enhance consumers' emotional engagement and increase the likelihood of impulse buying by reducing cognitive effort and accelerating decision-making processes (Chen vd., 2019; Hostler vd., 2011). Based on the information presented above, the following hypothesis has been formulated:

H<sub>1</sub>: Quality of personalized product recommendations significantly influences online impulse buying behavior.

Continuous trust is defined as a form of trust that develops over time as a result of ongoing interactions (Holsapple ve Wu, 2008). Trust that emerges from positive experiences with sellers and accumulated information can evolve into long-term trust as parties come to understand each other better and uncertainty is reduced (Holsapple ve Wu, 2008). Zhou (2012) argues that continuous trust arises after the initial trust stage and is shaped by subsequent

experiences. Establishing trust in online environments, in particular, entails several challenges. Due to low entry and exit barriers, uncertainty regarding physical investment cues such as buildings and personnel, the inability to evaluate products as in physical settings, and limited interpersonal interaction, the formation of trust in online contexts is more difficult (Head ve Hassanein, 2002). For this reason, continuous trust that develops over time on online platforms becomes a critical factor in consumers' decision-making processes. In this context, individuals' intentions to engage in transactions during the online shopping process depend on the level of trust they place in the e-marketplace (Lu et al., 2011). Accordingly, trust in the platform is argued to have a positive effect on purchasing behavior and to exert a significant influence on impulse buying behavior (Chen et al., 2019; Wu et al., 2020). When consumers experience trust, they process information more easily and expend less cognitive effort in evaluation. In situations where the decision-making process is simplified, impulse buying is more likely to occur (Stern, 1962). Based on the information presented above, the following hypothesis has been formulated:

H<sub>2</sub>: Continuous trust significantly influences online impulse buying behavior.

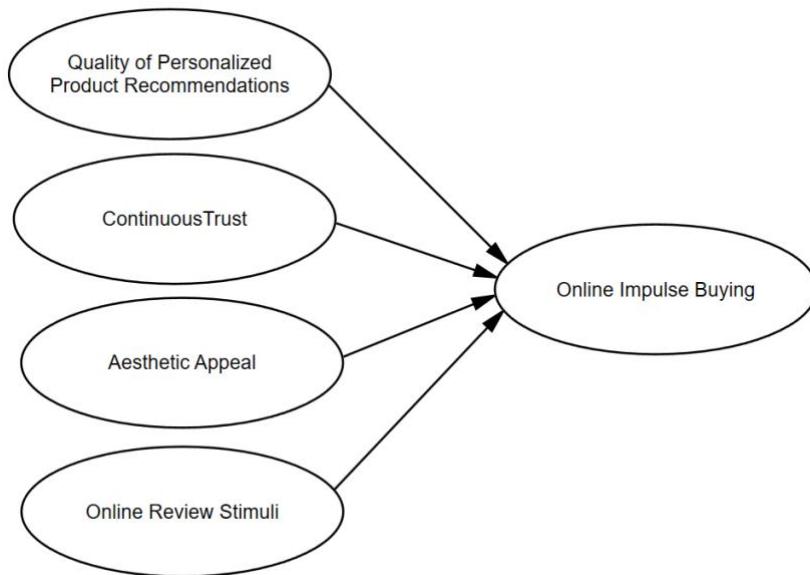
Aesthetic appeal refers to the use of visual design elements—such as typography, colors, page layout, and graphical features—to make products more attractive in product recommendation presentations (Jiang ve Benbasat, 2007). In digital environments, aesthetic appeal is defined as the degree of pleasure and enjoyment derived from a website (Lavie ve Tractinsky, 2004). In particular, elements such as fonts, graphics, and colors used on websites are employed to capture consumers' attention and enhance their engagement (Hall ve Hanna, 2004). Empirical studies indicate that aesthetic appeal increases satisfaction through pleasure and arousal, which in turn influences purchase intentions (Wang et al., 2010). Another important advantage of aesthetic appeal is its ability to enhance the perceived value of the products or services offered and to facilitate the formation of emotional bonds between consumers and brands (Goldman, 2005). Within this framework, the emotional responses elicited by aesthetic appeal can be regarded as a key mechanism shaping consumers' purchasing behaviors. Indeed, vivid and appealing information presented in digital environments strengthens users' emotional reactions (Zhang, 2013). Visual elements offered in online stores, in particular, have been shown to exert a positive influence on impulse buying behavior (Zou, 2015). The aesthetic appeal of the presented product fosters favorable attitudes toward the product (Chen et al., 2019), while the aesthetic structure of online stores provides positive stimuli that can lead to impulse buying during the

shopping process (Himawari et al., 2018). Based on the information presented above, the following hypothesis has been formulated:

H<sub>3</sub>: Aesthetic appeal significantly influences online impulse buying behavior.

Online reviews refer to the sharing of opinions, information, and experiences regarding the products or services offered (Cheung et al., 2009). With advancements in technology, reviews that were once shared solely in text form have increasingly been replaced by hybrid reviews enriched with multimedia features, including the integration of visual content (Wu et al., 2021). Such shared content needs to be rich in both informational and sensory attributes. Information-dense evaluations enhance product visibility and attractiveness, thereby contributing positively to purchase intentions (Archak et al., 2011). Sensorially enriched texts enhance the vividness of product descriptions and imagined consumer experiences by increasing consumers' mental imagery, thereby playing a decisive role in the formation of purchase decisions (Cheung and Thadani, 2012). Online reviews are widely recognized as having a significant influence on consumers' purchasing behaviors (Park et al., 2007). Consumers shape their purchase decisions based on multiple information sources, and online reviews, in particular, contribute positively to brand choice and attitudes (Godes ve Mayzlin, 2004). Zhang et al. (2013) argued that consumers who incorporate online reviews into their decision-making processes may engage in impulse purchases triggered by reviews, even if they had not initially intended to buy the product. However, there are also studies suggesting that online reviews and evaluations—considered a form of electronic word-of-mouth (eWOM)—do not exert a significant effect on impulse buying behavior (Effendi et al., 2020; Pambagyo ve Karnawati, 2020). Based on the information presented above, the following hypothesis has been formulated:

H<sub>4</sub>: Online review stimuli significantly influences online impulse buying behavior.

**Figure 1:** Research Model

### 3. Method

#### 3.1. Population and Sample

The population of the study consists of individuals aged 18 and above who have previously engaged in online shopping. In determining the sample size, the approach recommended by Hair et al. (1998) was adopted, whereby the minimum sample size should be at least ten times the number of observed variables. The measurement instruments used in the study comprise a total of 21 items. Data were collected from 432 participants, and this number was deemed sufficient to meet the required sample size. A convenience sampling method was employed due to the accessibility of online consumers and the exploratory nature of the study. Participants were required to have prior online shopping experience to ensure the relevance of responses.

#### 3.2. Data Collection Method and Measurement Scales

To collect the research data, a questionnaire was developed and administered to participants online. All measurement scales originally developed in English were translated into Turkish using the translation-back translation method. Specifically, the items were first translated into Turkish by bilingual researchers and subsequently back-translated into English by an independent bilingual expert. The original and back-translated versions were compared to ensure semantic equivalence, and minor wording adjustments

were made where necessary. Following a pilot study conducted with 40 respondents, necessary revisions were made, and the final version of the questionnaire was prepared. After examining the data obtained from 432 participants, incomplete and erroneous responses were excluded, resulting in 403 valid questionnaires being included in the analysis. The questionnaire comprises five constructs measured by a total of 21 items, along with questions related to participants' demographic characteristics. All constructs were measured using scales that have been previously tested and validated in the literature in terms of reliability and validity.

The quality of personalized product recommendations was measured using five items, continuous trust with four items, aesthetic appeal with four items, online review stimuli with four items, and online impulse buying with four items. A five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was used to measure all constructs. The items measuring the quality of personalized product recommendations and online review stimuli were adapted from Ampadu et al. (2022); the items measuring continuous trust were adapted from Ashraf et al. (2020); the items measuring aesthetic appeal were adapted from Chen et al. (2019); and the items measuring online impulse buying were adapted from Ngo et al. (2025).

### **3.3. Analysis Procedure**

Structural equation modeling (SEM) was employed as the data analysis technique in this study. SEM enables the simultaneous examination of both direct and indirect relationships between observed and latent variables within a single integrated model, while incorporating measurement errors into the analysis, thereby contributing to more reliable and robust results. Unlike other statistical techniques, SEM adopts a confirmatory rather than an exploratory approach (Meydan ve Şeşen, 2011). Data analyses were conducted using SPSS 24.0 and AMOS 27.0 statistical software packages.

## **4. Results**

### **4.1. Descriptive Statistics**

The results of the descriptive statistics indicate that 47.5% of the participants were male and 52.5% were female. In terms of educational background, 361 participants held an associate degree or higher. With regard to shopping frequency, 54% of the respondents reported engaging in online shopping several times per month. An examination of average income levels reveals that 115 participants reported an income of 100,001 TL or above, while 100 participants reported an average income between 40,001 and 60,000 TL. Accordingly, it can be stated that the participants' income levels were relatively evenly distributed across lower and upper income ranges.

## 4.2. Confirmatory Factor Analysis

According to the two-step approach proposed by Anderson and Gerbing (1988), confirmatory factor analysis (CFA) should first be conducted for the constructs included in the model, followed by the assessment of validity and reliability. To evaluate the acceptability of the research model, it is necessary to examine the model fit indices. In this study, the  $\chi^2/df$ , RMSEA, GFI, AGFI, CFI, and TLI fit indices were employed to assess model fit. The model fit statistics and their corresponding reference values are presented in Table 1 (Meydan ve Şeşen, 2011; Schermelleh-Engel et al., 2003).

**Table 1: Fit Indices of the Confirmatory Factor Analysis (CFA) Model for All Variables Included in the Study**

Fit Indexes	Calculated Value	Suggested Value	
		Good Fit	Acceptable Fit
X <sup>2</sup> /df	2,669	0≤χ <sup>2</sup> /df≤2	2<χ <sup>2</sup> /df≤5
RMSEA	0,064	0≤RMSEA≤,05	05<RMSEA≤,09
GFI	0,931	,90≤GFI≤1	,85≤GFI<,90
AGFI	0,901	,90≤AGFI≤1	,85≤AGFI<,90
CFI	0,935	,97≤CFI≤1	,95≤CFI<,97
TLI	0,917	,95≤TLI≤1	,90≤TLI<,95

## 4.3. Validity and Reliability Analysis

After confirming that the goodness-of-fit statistics obtained from the confirmatory factor analysis fell within the recommended thresholds, analyses regarding the validity and reliability of the measurement model were conducted. To establish composite reliability, CR values are required to exceed 0.70; for convergent validity, AVE values should be at least 0.50; and for discriminant validity, the AVE value of each construct must be greater than the squared correlations between that construct and the other constructs in the model (Fornell ve Larcker, 1981). An examination of Table 2 indicates that all criteria related to composite reliability, convergent validity, and discriminant validity are satisfied.

Table 2: Validity and Reliability Results

	CR	AV E	MS V	AS V	Impul se Buying	Continuo us Trust	Recommendati ons	Aesthet ic Appeal	Onlin e Revie w Stimu li
<b>Impulse Buying</b>	0,76 1	0,51 7	0,14 8	0,09 2	0,719				
<b>Continuous Trust</b>	0,77 6	0,53 6	0,43 2	0,20 3	0,309	0,732			
<b>Recommendations</b>	0,77 6	0,53 8	0,43 2	0,20 9	0,385	0,657	0,734		
<b>Aesthetic Appeal</b>	0,76 6	0,52 4	0,23 6	0,17 0	0,339	0,452	0,486	0,724	
<b>Online Review Stimuli</b>	0,85 6	0,59 9	0,12 5	0,05 9	0,090	0,286	0,148	0,354	0,774

#### 4.4. Structural Equation Modeling Analysis

Following the analysis of the structural model, the model fit indices were examined and yielded the following values:  $\chi^2/df = 2.669$ , RMSEA = 0.064, GFI = 0.931, AGFI = 0.901, CFI = 0.935, and TLI = 0.917. These values fall within the acceptable reference ranges, indicating an adequate model fit; therefore, hypothesis testing was conducted. The results of the hypothesis tests are presented in Table 3. The findings indicate that the quality of personalized product recommendations has a significant and positive effect on online impulse buying, leading to the acceptance of H<sub>1</sub>. In contrast, continuous trust was shown to have no statistically significant impact on online impulse buying behavior, and thus H<sub>2</sub> was rejected. The results further show that aesthetic appeal has a meaningful influence on consumers' online impulse buying behavio, supporting the acceptance of H<sub>3</sub>. However, online review stimuli were shown to have no statistically significant impact on online impulse buying behavior, resulting in the rejection of H<sub>4</sub>.

Table 3: Structural Equation Modeling Results

Independent Variable	Dependent Variable	Standardized Regression Coefficient	Standard Error	C.R.	Significance	Results
Personalized recommendations	Online Impulse Buying	,251	,141	2,507	,012	H <sub>1</sub> : Kabul
Continuous trust	Online Impulse Buying	,063	,131	,650	,516	H <sub>2</sub> : Red
Aesthetic appeal	Online Impulse Buying	,202	,125	,650	,013	H <sub>3</sub> : Kabul
Online review stimuli	Online Impulse Buying	-,037	,099	-,572	,568	H <sub>4</sub> : Red

## 5. Conclusion

This study sought to investigate the factors influencing online impulse buying behavior within the framework of the quality of personalized product recommendations, aesthetic appeal, continuous trust, and online review stimuli. The findings indicate that online impulse buying behavior is predominantly driven by emotional and experiential stimuli, whereas cognitive and evaluative mechanisms play a more limited role in shaping this behavior.

According to the results, the quality of personalized product recommendations has a significant and positive effect on online impulse buying behavior. This finding is consistent with prior studies suggesting that recommendation systems enhance perceived usefulness, reduce search costs, and facilitate consumers' spontaneous purchase decisions (Hostler et al., 2011; Chen et al., 2019; Ampadu et al., 2022). High-quality personalized recommendations function as contextual purchase triggers for consumers, shortening the cognitive evaluation process and enhancing the propensity for impulse buying. Similarly, aesthetic appeal was found to exert a significant and positive influence on online impulse buying behavior. This result aligns with existing research demonstrating that visual elements used in online stores strengthen consumers' emotional responses and encourage impulse buying by increasing arousal and pleasure (Zou, 2015; Himawari et al., 2018; Chen et al., 2019). Aesthetically appealing digital environments retain consumers' attention for longer periods and facilitate faster, less deliberative purchasing decisions.

In contrast, continuous trust was shown to have no statistically significant impact on online impulse buying behavior. Although the literature provides substantial evidence that trust plays a crucial role in online purchase intentions (Lu et al., 2011; Wu et al., 2020), the findings of this study suggest that trust may be more closely associated with planned and high-involvement purchasing decisions. Given the spontaneous nature of impulse buying, trust—which develops over time and is grounded in accumulated experience—may exert only a limited influence in such contexts. Similarly, online review stimuli were found to have no significant effect on online impulse buying behavior. While this finding partially diverges from studies emphasizing the impact of online reviews on purchase decisions (Park et al., 2007; Zhang et al., 2013), it is consistent with research demonstrating that electronic word-of-mouth does not significantly influence impulse buying behavior (Effendi et al., 2020; Pambagyo ve Karnawati, 2020). This result suggests that online reviews are more influential in purchasing processes that require deliberate and conscious evaluation, whereas their role in impulse buying behavior remains limited.

The findings obtained in the study demonstrate that continuous trust and online reviews, which are traditionally accepted as strong determinants of online purchase intention, are not equally effective in unplanned and instantaneous purchasing actions. From a theoretical perspective, this situation confirms that the impulse buying process is dominated by emotional and experiential stimuli (such as aesthetic appeal and personalized recommendations) rather than cognitive evaluations. The lack of impact from factors like trust and user reviews indicates that when consumers purchase a product with an instantaneous urge, they do not engage in an in-depth information search or they bypass time-consuming cognitive processes such as risk assessment. In this context, the study theoretically reveals that trust and online reviews are not decisive in every purchasing scenario, and their explanatory power remains limited particularly in cases where the pursuit of immediate gratification is at the forefront.

### **5.1. Theoretical Contributions**

This study makes important theoretical contributions to the literature on online impulse buying. The results demonstrate the need to clearly distinguish between emotional-experiential stimuli (aesthetic appeal and personalized product recommendations) and cognitive-evaluative factors (trust and online reviews) in explaining impulse buying behavior. In this respect, the study extends existing theoretical models by showing that well-established constructs such as trust and eWOM are not sufficient to explain impulse buying behavior under all conditions, thereby highlighting the boundary conditions of these traditional predictors.

### **5.2. Managerial Implications**

The findings also offer significant managerial implications for e-commerce platforms and digital marketing managers. First, investing in high-quality personalized product recommendation systems emerges as a critical strategy for stimulating online impulse buying behavior. Recommendations that are consumer preference-based, context-aware, and delivered in a timely manner can enhance sales performance. Moreover, emphasizing aesthetic appeal in website and mobile application design can strengthen consumers' emotional engagement and increase the likelihood of impulse buying. By contrast, strategies aimed at building trust and encouraging online reviews may be more effective for fostering long-term customer loyalty and planned purchasing behaviors.

### **5.3. Limitations and Directions for Future Research**

The data used in the study were collected through a cross-sectional method, which limits consumer responses to a specific point in time. This constraint

makes it difficult to definitively establish long-term causal relationships between variables or to observe the evolution of impulse buying behavior over time. The research sample consists exclusively of individuals with prior online shopping experience. While this ensures the validity of the responses, the use of convenience sampling may limit the generalizability of the findings to the general population or to all demographic groups of digital consumers. Online impulse buying behavior was examined within a general e-commerce framework. However, consumer behavior may vary significantly across different digital platforms (e.g., social commerce, mobile apps, or desktop) and product categories (e.g., fashion, electronics, or digital services).

Future research may employ longitudinal research designs to investigate the dynamics of online impulse buying behavior over time. Moreover, incorporating variables such as emotional states, hedonic motivations, or individual impulsivity into the research model would contribute to a more comprehensive explanation of impulse buying behavior. Comparative studies conducted across different digital platforms and product categories may also offer valuable contributions to the literature.

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