Multi-Sensory Marketing and Impulsive Buying Behavior: The Role of Impulsive Buying Traits

Nguyen Le [1*], Ngoc Thi Bich Mai [1], Nhu Y Thi Nguyen [1], Huyen Ngoc Thi Vu [1]

[1] *Faculty of Business Administration, Industrial University of Ho Chi Minh City, Ho Chi Minh City, Viet Nam.*

Abstract

The rapid growth of the retail market, coupled with increased consumer income, has led to a surge in impulsive and unplanned shopping. This study aims to examine the relationships between multi-sensory marketing, customers' moods, impulsive buying traits, and impulsive buying behavior, using the Stimulus-Organism-Response (S-O-R) model. Customers' mood acts as a mediator and impulsive buying traits as a moderator. The researchers surveyed 450 consumers in Vietnam using the method of non-probability sampling and analyzed the data using SPSS and Smart PLS 4.0. The results show that customers' moods and impulsive buying traits positively influence impulsive buying behavior, with impulsive buying traits also significantly moderating the relationship between mood and impulsive buying. Additionally, customers' moods mediate the relationship between multi-sensory marketing and impulsive buying behavior. This research fills gaps in previous research by incorporating multi-sensory marketing and impulsive buying traits as variables and provides managerial implications for businesses and retailers to develop effective marketing strategies to encourage impulsive purchases and increase sales. Academically, the research reaffirms the relevance of the S-O-R model in the retail context and paves the way for future investigations into consumers' impulsive buying behavior.

1- Introduction

In Vietnam, the retail market has undergone significant changes due to economic development and global integration. The Ministry of Industry and Trade (2024) [1] reported a 9.6% increase in total retail sales of goods and revenue of consumer service in 2023, reaching 6,231.8 trillion VND (around 246 billion USD) compared to 2020. This growth, coupled with rising consumer income, has led to a rise in impulsive purchase behavior. Additionally, impulsive buying behavior plays a vital role in supermarket product consumption, accounting for 27–62% of total sales in large stores [2]. Studies indicate that a considerable percentage of consumers engage in impulsive buying, with 65% occasionally making unplanned purchases and impulse buying rates reaching up to 80% in retail businesses [3, 4].

The phenomenon of impulsive purchasing is often accompanied by a palpable sense of excitement and joy and an irrepressible urge to acquire, rendering it a considerable challenge for consumers to restrain such behavior [5]. Moreover, sensory perceptions within retail environments, particularly the utilization of augmented reality (AR) applications, exert a significant influence on impulsive purchasing habits [6]. Intriguing disparities have been observed in the impulsive buying tendencies of individuals, with women demonstrating a proclivity for spontaneous clothing or footwear acquisitions, while men exhibit a greater propensity for impulsive electronic purchases [7]. Additionally, age appears to be a factor, with younger customers exhibiting a greater susceptibility to impulse shopping compared to their older counterparts [8].

The pivotal role of multi-sensory marketing lies in its ability to craft immersive experiences that cultivate impulsive buying proclivities, as sensory cues such as sight, sound, scent, and tactile stimuli have been shown to impact consumer behavior within supermarket settings [9, 10]. By judiciously leveraging sensory stimuli and crafting engaging atmospheres, retailers can enhance impulse buying tendencies and foster consumer loyalty through personalized and captivating experiences [11]. Intriguingly, no previous study has amalgamated the entirety of sensory signals within a single investigation. Extant research has primarily focused on store factors like color, light, scent, and music without considering the personal traits of customers, particularly their impulsiveness [12]. This research endeavors to chart a novel course by examining the collective impact of multisensory marketing, which harmonizes diverse senses, on customers' emotional states during the shopping experience. By integrating visual, auditory, olfactory, and other sensory signals, the study aspires to offer a fresh perspective on multisensory marketing and its influence on impulsive buying behavior.

Despite the significant sway of customers' moods on impulsive buying behavior, the impact is ultimately overridden by their inherent impulsiveness. This study incorporates the examination of impulsive buying traits, thereby bridging the gap between moods and impulsive buying behavior by Sagha et al. [12], which represents another novel facet of this inquiry. To delve into the relationship between multisensory marketing, customers' moods, impulsive buying traits, and impulsive buying behavior, this study shall employ the Stimulus-Organism-Response (S-O-R) model. The S-O-R model further explores factors like interaction, time limits, price discounts, atmospheric, and opinion leaders cues in live e-commerce, all of which exhibit a positive correlation with impulse purchase, with the flow of experience mediating this process [13]. Additionally, it shall investigate the moderating effect of impulsive buying traits on the relationship between moods and impulsive buying behavior. The findings of this research will yield valuable recommendations and solutions for businesses, empowering them to develop effective marketing strategies that differentiate their brands and enhance customers' impulsive buying tendencies, thereby augmenting sales revenue.

2- Literature Review

2-1- Theories

The Stimulus-Organism-Response (S-O-R) model

The S-O-R model, originally conceived by Russell & Mehrabian (1974) [14], stands as a fundamental theoretical framework for the examination of consumer behavior. This esteemed model has found widespread application across various research domains, including the adoption of payment systems [15], tourism conduct [16], healthcare service delivery [17], etc.

At its core, the S-O-R model posits that external stimuli exert influence upon internal organismic processes, which in turn engender specific behavioral responses. In the retail context, the store atmosphere functions as a stimulus, evoking emotional responses from consumers that ultimately shape their purchasing behavior [18]. Thus, the S-O-R model offers invaluable insights into the intricate interplay between stimuli in the retail environment, consumer emotions, and purchasing tendencies. This comprehensive framework enhances our understanding of how retail settings shape emotional states and influence customer shopping proclivities [18].

Impulsive Buying Behavior

Impulsive buying behavior, as originally defined by Stern (1962) [19], refers to the unplanned and spontaneous purchase of products, often influenced by factors such as price and the store environment. This behavior is characterized by quick decision-making and a subjective preference for immediate possession [20-22]. Researchers such as Rook (1987) [23], Rook & Gardner (1993) [21], and Donovan (1994) [24] have incorporated emotional elements and urges into the concept of impulsive buying behavior. Subsequent studies by Beatty & Elizabeth Ferrell (1998) [25], Sharma et al. (2010) [26], and Verhagen & Van Dolen (2011) [27] emphasize the suddenness and unplanned nature of impulsive buying behavior, where consumers make quick purchasing decisions driven by strong impulses. Cho et al. (2014) [28] also characterize impulsive buying behavior as purchases made without prior planning, driven by strong impulses.

Multi-Sensory Marketing

According to Krishna & Elder (2011) [29], sensory marketing refers to the use of marketing strategies that stimulate consumers' senses, influencing their product evaluations and purchasing behavior. Multisensory marketing, in particular, involves engaging multiple senses, including visual, auditory, olfactory, gustatory, and tactile experiences, to shape consumer perceptions [30]. Soares & Niemiller (2013) [31] further explain that multisensory marketing entails creating sensory experiences in the retail environment through product displays to engage customers' senses and enhance their shopping experiences. Multisensory marketing has been successfully employed in various contexts [32-39].

Shabgou & Daryani (2014) [40] underscore the importance of human senses in shaping the shopping experience and advocate for sensory stimulation strategies such as color, scent, music, and store layout, which significantly influence consumer purchasing behavior. Additionally, Kim (2019) [41] evaluates multi-sensory marketing based on four factors:

facility aesthetics, layout, music, and scent. Facility aesthetics encompass design, artwork, landscaping, colors, and lighting, while layout includes considerations of space, aisle arrangement, and product presentation [42]. Therefore, multisensory marketing is operationalized and measured as multidimensional factors through four factors within the store environment, such as facility aesthetics [42], layout, music [43], and scent [44], to assess the comprehensive concept of multi-sensory marketing in the retail environment.

2-2- Research Hypotheses

Multi-Sensory Marketing on Customers' Moods

The power of multi-sensory marketing has long been recognized by savvy marketers, yet its consistent application to captivate customers has hitherto been lacking. However, in recent years, brands have begun to strategically integrate sensory elements to shape the shopping experiences of their clientele. Brand authority Martin Lindstrom posits that consumers are particularly swayed when multiple senses, including the visual, auditory, and olfactory, are harmoniously combined. Within the retail milieu, these three senses are readily stimulated by an array of in-store factors. Isaac et al.'s (2023) [45] work underscores how multi-sensory marketing factors influence non-economic performance in the food service sector. Lindstrom (2006) [46] seminal work demonstrates that within the retail environment, customers' three primary senses are easily aroused, with visual (80%), olfactory (45%), and auditory (41%) stimuli proving the most impactful. Yang (2023) [47] study further elucidates how sensory experiences shape subsequent consumer behavior and intention.

Facility aesthetics, encompassing interior design, artwork, landscaping, color, and lighting, all contribute to the allure of the store environment [42]. Prior research by Park & Farr (2007) [48], Mohan et al. (2013) [49], and Biswas et al. (2016) [50] indicates that facility aesthetics profoundly influence customers' moods. The store layout is another crucial factor, as highlighted by Blizek & Berlyne (1971) [51] and Scherer (1984) [52], with Cho et al. (2014) [28] finding that an appealing, well-organized layout with comfortable, convenient pathways enhances the shopping experience, reduces stress, and positively impacts customers' moods. Beyond facility aesthetics and layout, music also plays a vital role in stimulating customers' moods [53]. Ndengane et al.'s (2021) [43] work demonstrates that the mere presence of in-store music leads to more positive moods compared to its absence. Similarly, the influence of scent on customers' moods has been evidenced by Michon et al. (2005) [54], Chebat & Michon (2003) [55], and Smeets et al. (2008) [44].

Based on the arguments, the following hypothesis was proposed:

H1: Multi-sensory marketing has a positive and direct impact on customers' moods.

Customers' Moods and Impulsive Buying Behavior

Mood is a factor that has a greater impact than other factors because whether a customer's mood is positive or negative affects impulsive buying behavior. According to research by Rook & Gardner (1993) [21], excited and happy moods lead to impulsive purchases (accounting for 85% of people surveyed). The research of Youn & Faber (2000) [56] also shows that even a bad mood affects consumers' impulsive buying behavior. The impact of consumers' moods on impulse buying behavior is widely recognized as a critical psychological factor [57-59]. Rook & Gardner (1993) [21] conducted research indicating that feelings of excitement and happiness lead to impulsive buying behavior in a significant portion of individuals, with up to 85% of surveyed participants exhibiting this behavior. The authors suggest that positive moods increase the inclination to reward oneself and serve as motivation for shopping. However, Youn & Faber (2000) [56] have noted that even when individuals are in an unhappy mood, their impulsive buying behavior is still influenced. Febrilia & Warokka (2021) [60] further emphasize the significant influence of consumers' moods on spontaneous purchasing decisions, particularly in the context of online stores.

Based on the arguments, the following hypothesis was proposed:

H2: Customers' moods have a direct and positive impact on impulsive buying behavior.

Customer's Moods as Mediator

Extant research has robustly demonstrated the influence of multi-sensory marketing on customers' moods [61]. Retailers strategically leverage various elements of the in-store environment, such as color, lighting, textures, and layouts [62], as well as music [53] and scents [63], to stimulate desired emotional states among patrons. Furthermore, studies by Amelia & Ronald (2021) [57], Febrilia & Warokka (2021) [60], and Watang & Miswanto (2022) [59] have substantiated that customers' mood significantly influences impulsive buying behavior. Hussain et al. (2021) [64], Ulfa Rantelina et al. (2023) [65], and Putra & Rahanatha (2023) [66] propose that mood serves as an intermediary between the in-store environment and consumers' impulse purchasing tendencies. Congruently, the S-O-R model by Russell & Mehrabian (1974) [14] suggests that mood functions as a mediating factor in the relationship between the store environment and consumers' behavioral outcomes.

Based on the arguments, the following hypothesis was proposed:

H3: The customers' mood mediates the relationship between multi-sensory marketing and the customers' impulsive buying behavior.

Impulsive Buying Traits and Impulsive Buying Behavior

Extant research has elucidated that impulsive buying traits and behavior are influenced by a tapestry of factors, including hedonic motivation, self-esteem, self-control, enjoyment tendency, impulsive tendency, store crowding, and peer influence. These internal and external elements have been found to significantly impact impulsive purchasing behavior [67-69]. Impulsive buying traits can be characterized by two distinct dimensions: the first denotes an abrupt, impulsive urge to make immediate purchases, while the second involves acting on emotional impulses without much deliberation or consideration of consequences [25]. Lin & Chuan (2013) [70] argue that impulsive buying behavior among young individuals is associated with impulsive urges and is positively correlated with impulsive purchasing conduct. Similarly, Meng et al. (2019) [71] found that individuals with high levels of impulsivity tend to make purchasing decisions without much premeditation or planning, thereby fostering impulsive buying behavior. Consistent with these findings, Sokić et al. (2020) [72], Chen et al. (2023) [73], and Cuandra (2022) [74] have investigated the relationship between impulsive buying traits and impulsive buying behavior, confirming a significant positive correlation between the two.

Based on the arguments, the following hypothesis was proposed:

H4: *Impulsive buying traits have a direct and positive impact on impulsive buying behavior.*

Impulsive Buying Traits as Moderator

Prior research indicates that consumer mood positively influences impulsive purchasing behavior, an effect that may be contingent on the degree of consumer impulsivity. Rook & Gardner (1993) [21] established that impulsive buying traits, as a consumer characteristic, impact impulsive buying behavior. Changa et al. (2011) [75] utilized the S-O-R model to explore how impulse buying influences consumers' emotions and intentions toward impulsive buying, suggesting that impulse buying can affect the emotions-impulsive buying behavior relationship. Highly impulsive individuals may experience joy during purchases, thereby escalating impulsive buying behavior [75]. Conversely, those with low impulsivity display hesitation and contemplation. Mishra et al. (2014) [76] also examined the role of impulse buying in regulating consumers' emotions and impulsive buying behavior.

However, limited studies have investigated the moderating role of impulsivity in the mood-impulsive shopping behavior relationship. Pratama & Roostika (2023) [67] suggested that impulsive buying traits moderate the relationship between mood and impulsive shopping behavior. Hiebler-Ragger et al. (2018) [77] demonstrated the moderating influence of personality on the emotional-religious/spiritual well-being relationship. Kamaruddin et al. (2020) [78] argued that personalities directly impact behavior and regulate the influence of emotions on behavior. Impulsiveness is a component of consumers' personality traits [79]. Sagha et al. (2022) [12] also noted that personality can mediate the relationship between consumers' moods and behavior. Thus, this study aims to examine the moderating effect of impulsive buying traits and clarify how consumers exhibit diverse impulsive buying behaviors based on this moderating effect.

Based on the arguments, the following hypothesis was proposed:

H5: *Impulsive buying traits play a moderating role in the relationship between customers' moods and impulsive buying behavior.*

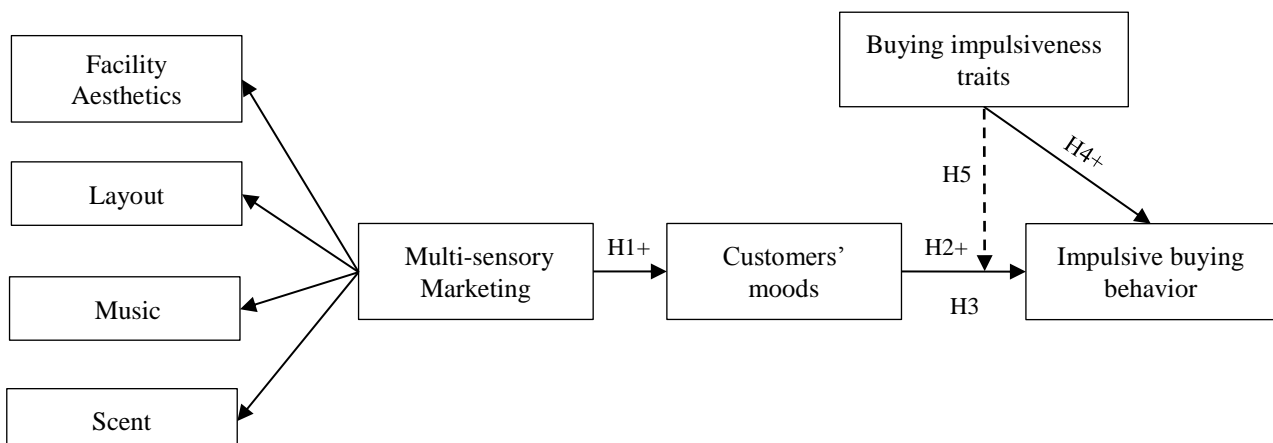Based on the aforementioned hypotheses, the authors propose the research model illustrated in Figure 1.

Figure 1. Proposed research model

3- Methods

3-1- Methodology

The study employed mixed research methods, both qualitative and quantitative, as depicted in Figure 2.
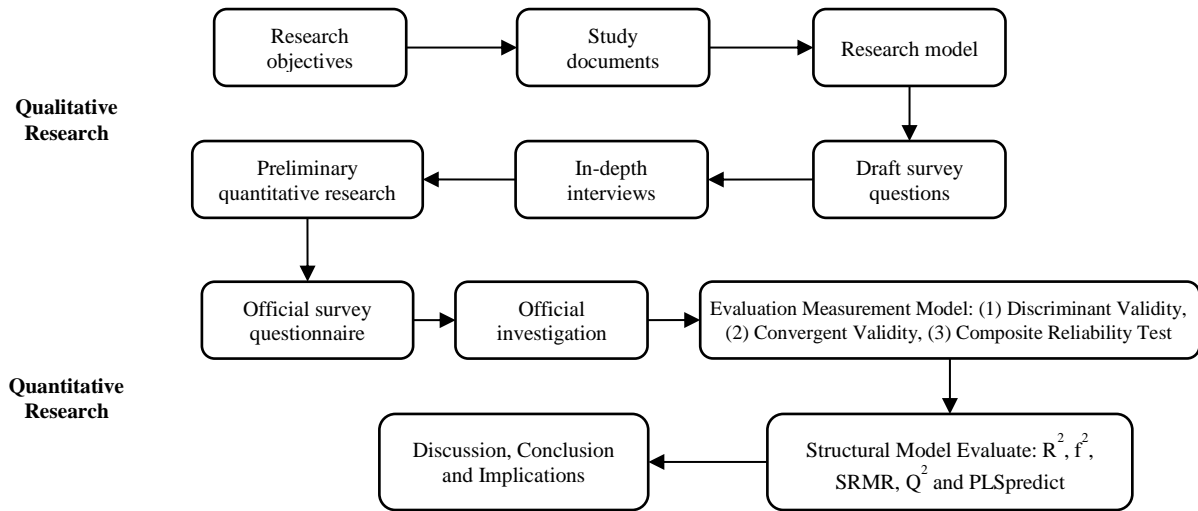

Figure 2. The research processes

Qualitative research: Firstly, the authors observed the somber atmosphere in many fashion stores in Vietnam. Subsequently, they engaged in discussions with 20 consumers to explore impulsive buying behavior and establish research objectives. The authors concluded that the majority of consumers paid significant attention to the ambiance of the stores they visited. Factors such as lighting and music played a persuasive role in encouraging them to make clothing purchases without much consideration. Drawing on the feedback from consumers, the authors integrated these concepts into the constructs of the research model through a comprehensive literature review. They then formulated hypotheses and developed a projected research model.

Following this, the authors have conducted the in-depth interviews with 10 consumers, 1 Associate Professor, and two lecturers in business administration and marketing, who possessed expertise in consumer behavior research and a profound understanding of impulsive buying behavior. These interviews allowed for adjustments to the measurement scales to ensure alignment with the research context. Subsequently, the authors conducted a preliminary quantitative research study involving 50 consumers to further refine the measurement scale. Once the preliminary quantitative research was completed, the authors proceeded with the official survey.

Quantitative research: Following the qualitative phase, the authors administered an official survey both offline (300 samples) and online (150 samples), totaling 450 respondents. The collected data underwent analysis using SPSS and SmartPLS software to assess the measurement of structural models.

3-2- Measurements

In this research article, the authors developed a scale by selecting relevant research items from articles published on reputable and highly reliable journals (Table 1). The scale consists of a total of 34 observed variables, which are organized into 4 first - order factors, 1 second - order factor, 1 intermediate factor, 1 moderating factor, and 1 dependent factor. To assess consumers' agreement with the stated opinions, a 5-point Likert scale was employed (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = completely agree). The choice of this scale was based on its widespread usage and suitability for addressing the research problem.

Table 1. Measurement scales

Factors	Code	Items	Sources
Facility Aesthetics	FA	6	Şahiner (2016) [42]
Layout	L	4	Cho et al. (2014) [28]
Music	M	4	Ndengane et al. (2021) [76]
Scent	S	4	Smeets et al. (2008) [44]
Customers' Moods	CM	5	Febrilia & Warokka (2021) [60]
Impulsive Buying Traits	IBT	6	Meng et al. (2019) [71]
Impulsive Buying Behavior	IBB	5	Beatty & Ferrell (1998) [25], Cho et al. (2014) [28]

3-3- Collect Research Data

A convenient non-probability sampling technique was utilized across the consumers surveyed in supermarkets from the Southeast provinces of Vietnam, including Ho Chi Minh City, Binh Duong, and Dong Nai. This is advantageous for use in a point of sale or shopper research environment. As per this logic, the randomly selected sample is often very generalized and representative because every participant has a one in a million (in the sample size) chance of being selected. In addition, these provinces were selected by the authors because the aggregated retail revenue of these provinces contributes to over 20% of Vietnam's total retail revenue [80, 81]. The results suggest that Ho Chi Minh City residents and the surrounding provinces are more likely to represent Vietnamese consumers.

According to Hair et al. (2022) [82], the minimum sample size requirement depends on the level of significance and the different dimensional ranges of the path coefficients. Assuming that the minimum path coefficient expected to be significant falls between 0.11 and 0.20, approximately 155 observations are needed for the corresponding effect to be significant at the 5% significance level. Additionally, according to Comrey & Lee (1992) [83], sample sizes can be assessed as follows: 100 as poor, 200 as good, 300 as good, 500 as very good, and 1,000 or more as excellent. The authors intend to survey approximately 450 respondents (150 online and 300 offline). This approach aims to eliminate ineffective responses and ensure a sufficient number of responses to meet the research objective, which involves surveying consumers in Vietnam.

3-4- Measurement Model Analysis

First of all, the authors have employed the SPSS 24 version to describe the statistic and ensure the reliability and normal distribution of the data set through the Harman single-factor test with a total variance < 50% [84], the Kurtosis and Skewness test within ± 1.96 [82]. Then, the authors employed exploratory factor analysis (EFA test) to ensure the convergent and discriminant of the observed variables.

After analyzing and eliminating inapporiate data with SPSS 24, the authors have used the SmartPLS Software 4.0 version to analyze the remaining data set. The authors have applied Partial Least Square Structural Equation Modelling (PLS-SEM) method to analyze the data due to the complexity of the model (mixed of higher-order variables, mediator, and moderator) [82]. Then, the 2-step PLS-SEM analysis process for the higher-order variable and the bootstrapping technique to test path coefficients have been applied in this research.

4- Results

4-1- Descriptive Statistics of the Sample

The authors have distributed the survey questionnaire through social networking platforms like Facebook and Zalo. A link to the questionnaire, created using Google Form, was shared with consumers in the provinces of Binh Duong and Dong Nai. In addition, the authors personally surveyed 300 consumers who were shopping at various retail locations, including Circle K, GS25, and Winmart, as well as supermarkets like Emart, LotteMart, and MegaMart, as well as shopping centers like Aeon Mall, Vincom, and Parkson. The age of these consumers is 18 years or older, this is an age group with high shopping ability and regularly participating in consumer activities. This strategy allowed the authors to gather opinions from consumers who had made or were making impulsive purchases and resided in Ho Chi Minh City. Using a convenient and non-probability sampling method enabled the authors to save time while accurately identifying the research subjects as consumers in the retail market. The authors have surveyed 450 respondents who lived and worked in areas with the highest retail sales in Vietnam, making the survey sample highly representative of Vietnamese consumers. After removing 45 invalid questionnaires, the final sample consisted of 405 respondents. Thus, upon data cleansing, the authors obtained a comprehensive dataset comprising responses from 405 participants.

In the 405 survey samples depicted in Table 2 and Figures 2 and 3, there were 236 female customers, constituting 58.3% of the total, surpassing the number of male customers at 169 individuals, representing 41.7%. Regarding age distribution, individuals aged between 26 and 34 accounted for the highest proportion with 172 respondents, making up 42.5% of the sample, indicating a strong inclination towards impulsive purchases in this age bracket. The second highest age group, comprising individuals aged 18 to 25, included 153 respondents, constituting 37.8% of the sample. Following this, the age group of 35 to 45 accounted for 15.3%, while the age group of 46 to 54 constituted 3.5%. Customers aged over 55 formed the smallest group, with only 4 individuals making up 0.9% of the sample. Regarding income, the majority of surveyed customers, 164 individuals (40.5%), reported incomes ranging from 300 to 600 USD, followed by 158 individuals (39.0%) earning between 200 to 300 USD. In contrast, 70 individuals (17.3%) reported incomes between 600 - 1,200 USD, and the lowest income bracket, over 1,200 USD, consisted of 13 individuals (3.2%). Regarding educational attainment, the largest customer group possessed a college-intermediate-level education, with 164 individuals, representing 40.5% of the sample. The high school level group ranked second, comprising 158 individuals (39.0%), while the university degree group came in third with 70 individuals (17.3%). Postgraduate degree holders constituted the smallest customer group, with only 13 individuals (3.2%).

Table 2. Descriptive statistical results (n=405)

| Gender	405	100%
Male	169	41.7%
Female	236	58.3%
Age	**405**	**100%**
18 – 25 years old	153	37.8%
26 - 34 years old	172	42.5%
35 - 45 years old	62	15.3%
46 - 54 years old	14	3.5%
Over 55 years old	4	0.9%
Educational Level	**405**	**100%**
High school	158	39.0%
College - Intermediate	164	40.5%
University	70	17.3%
Postgraduate	13	3.2%
Income	**405**	**100%**
From 200 - 300 USD	158	39.0%
From 300 - 600 USD	164	40.5%
From 600 - 1,200 USD	70	17.3%
Over 1,200 USD	13	3.2%
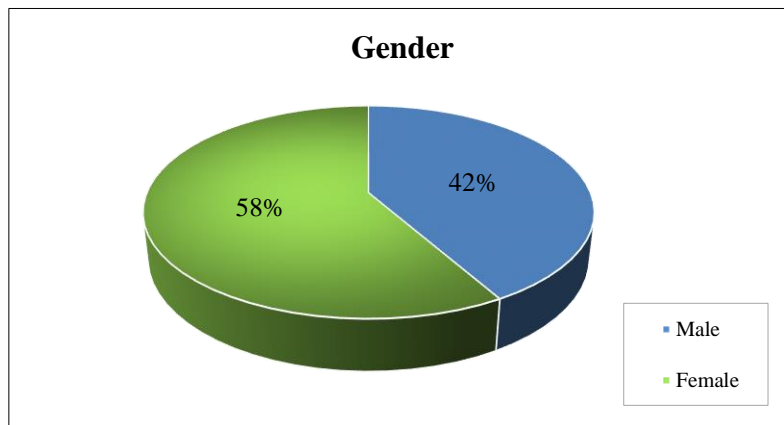
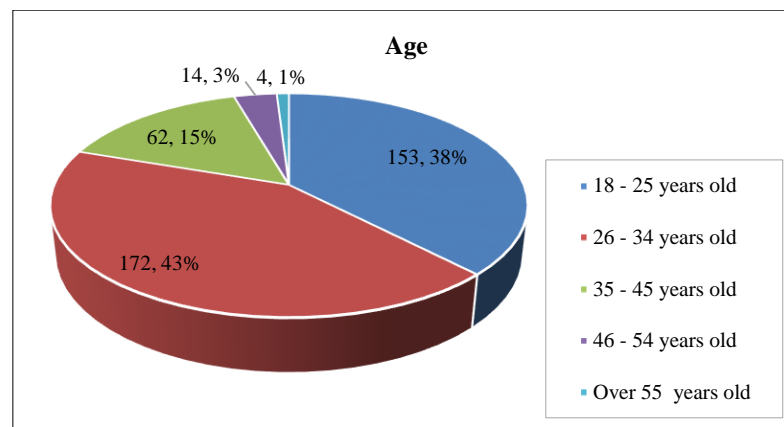

Figure 3. Gender of respondents

Figure 4. Age of respondents

4-2- Common Method Bias (CMB) and Multicollinearity

The data underwent screening using the Harman single-factor test in SPSS 24 software. Results revealed that a single factor accounted for only 32.316% of the total variance (<50%). As per Cooper et al. (2020) [84], data are not affected

by common bias issues when this variance is below 50%. Furthermore, the authors conducted a normality test utilizing Kurtosis and Skewness test, yielding results within ± 1.96, indicating the normal distribution of the data [82].

4-3- Exploratory Factor Analysis

As show in Tables 3 and 4, the results of the exploratory factor analysis (EFA) for each observed variable indicate a Kaiser-Meyer-Olkin (KMO) greater than 0.5 (0.939 > 0.5), a significant Bartlett's test statistic (Sig. = 0.000 < 0.05), and all the remaining factor loading coefficients are greater than 0.5. Consequently, the observed variables exhibit both convergent and discriminant validity during EFA analysis. Moreover, there is no evidence of factor confounding, indicating no overlap between the observed variables.

Table 3. EFA of independent and mediating variables

	Patterns Matrix					
	Components					
	1	**2**	**3**	**4**	**5**	**6**
FA5	0.798					
FA3	0.779					
FA1	0.769					
FA4	0.720					
FA2	0.681					
FA6	0.644					
IBT1		0.783				
IBT5		0.779				
IBT2		0.696				
IBT3		0.693				
IBT6		0.670				
IBT4		0.642				
CM5			0.760			
CM2			0.759			
CM1			0.716			
CM4			0.711			
CM3			0.664			
M1				0.875		
M4				0.715		
M3				0.697		
M2				0.662		
S3					0.833	
S2					0.715	
S4					0.705	
S1					0.552	
L4						0.836
L3						0.707
L1						0.705
L2						0.618
"Kaiser-Meyer-Olkin Measure of Sampling Adequacy"						0.939
"Bartlett's Test of Sphericity"			Approx. Chi-Square			6150.292
			df			406
			Sig.			0.000

Table 4. EFA of mediating and dependent variables

	Patterns Matrix		
	Components		
	1	**2**	**3**
IBT5	0.782		
IBT1	0.769		
IBT2	0.728		
IBT6	0.714		
IBT3	0.666		
IBT4	0.634		
CM1		0.798	
CM2		0.765	
CM5		0.747	
CM3		0.681	
CM4		0.664	
IBB2			0.782
IBB3			0.716
IBB1			0.689
IBB4			0.652
IBB5			0.636
"Kaiser-Meyer-Olkin Measure of Sampling Adequacy"			0.898
"Bartlett's Test of Sphericity"	**Approx. Chi-Square**		2639.390
	df		120
	Sig.		0.000

4-4- Measurement of SEM of First-Order Variables

As per Hair et al. (2022) [82], scale reliability is deemed satisfactory when Cronbach's alpha coefficient (CA) is more significant than 0.7, composite reliability (CR) is more significant than 0.7, and average variance extracted (AVE) is greater than 0.5. Table 5 indicates that both Cronbach's alpha coefficient (CA) and composite reliability (CR) of the scale are more significant than 0.7, thus meeting the stipulated criteria. Furthermore, all scales exhibit an AVE that is more significant than 0.5, signifying convergent validity, wherein latent variables account for more than half of the variance in the indices and scales to achieve convergent validity. Additionally, the external loading coefficient of each observed variable exceeds 0.7, satisfying the criteria for level 2 variable testing. The variance inflation factor (VIF) of all observed variables ranged from 1.282 to 2.251 (<3), suggesting the absence of multicollinearity.

Table 5. Outer loading, construct reliability and validity of first-order variables

Scale	Loading	CA	CR (rho_c)	AVE	VIFs	Scale	Loading	CA	CR (rho_c)	AVE	VIFs
FA		**0.885**	**0.912**	**0.634**		**CM**		**0.855**	**0.896**	**0.633**	
FA1	0.800				2.031	CM1	0.800				1.884
FA2	0.825				2.154	CM2	0.811				1.947
FA3	0.808				2.074	CM3	0.772				1.693
FA4	0.771				1.864	CM4	0.778				1.751
FA5	0.795				1.995	CM5	0.815				1.944
FA6	0.779				1.817						
L		**0.870**	**0.911**	**0.720**		**IBT**		**0.864**	**0.897**	**0.593**	
L1	0.822				1.970	IBT1	0.806				1.904
L2	0.842				2.045	IBT2	0.745				1.783
L3	0.857				2.283	IBT3	0.801				1.803
L4	0.873				2.459	IBT4	0.714				1.554
						IBT5	0.816				2.116
						IBT6	0.732				1.733

M		**0.847**	**0.897**	**0.686**		**IBB**		**0.827**	**0.878**	**0.591**
M1	0.836				1.990	IBB1	0.767			1.642
M2	0.829				1.883	IBB2	0.780			1.771
M3	0.831				1.907	IBB3	0.805			1.766
M4	0.816				1.815	IBB4	0.759			1.594
S		**0.836**	**0.890**	**0.670**		IBB5	0.732			1.511
S1	0.797				1.634					
S2	0.807				1.854					
S3	0.827				1.929					
S4	0.842				1.943					

As depicted in Table 6, the results demonstrate the assessment of discriminant validity for the latent variables in the model utilizing the heterotrait-monotrait (HTMT) criterion correlation. All HTMT values fall below the threshold of 0.85, indicating that all observed variables attain discriminant validity.

Table 6. Heterotrait-Monotrait (HTMT) criterion correlation of first - order variables

	CM	FA	IBB	IBT	L	M	S	IBT × CM
CM								
FA	0.622							
IBB	0.485	0.385						
IBT	0.379	0.260	0.329					
L	0.638	0.746	0.407	0.283				
M	0.571	0.481	0.217	0.496	0.648			
S	0.617	0.492	0.526	0.429	0.575	0.602		
IBT × CM	0.088	0.088	0.156	0.091	0.040	0.063	0.088	

4-5- Measurement of the SEM of Higher-Order Variables

Following the acquisition of latent variables for the higher - order variables (multi-sensory marketing, or MM), the authors commenced testing the second phase of the model. As shown in Table 7, the standardized root mean square residual (SRMR) of the model is 0.066 (< 0.08) and NFI is 0.852 (> 0.8), indicating the good fit of the proposed research model.

Table 7. Model fit

	Saturated model	Estimated model
SRMR	0.066	0.070
NFI	0.852	0.851

Table 8 illustrates that all scale reliabilities, indicated by Cronbach's alpha coefficient (CA) and composite reliability (CR), are more significant than 0.7, meeting the requisite standards. Moreover, the average variance extracted (AVE) is more significant than 0.5, indicating convergent validity for the variables, with the latent variable explaining more than half of the variance in the indicators and scales to achieve convergent validity. The external loading coefficients for each observed variable exceed 0.7. Furthermore, Table 10 reveals variance inflation factors (VIFs) for all observed variables (including latent variables), ranging from 1.504 to 2.188. All VIF values are under 3, signifying the absence of multicollinearity.

Table 8. Outer loading, construct reliability and validity of second - order variables

Scale	Loading	CA	CR (rho_c)	AVE	VIFs	Scale	Loading	CA	CR (rho_c)	AVE	VIFs
MM		**0.807**	**0.874**	**0.634**		**IBT**		**0.864**	**0.897**	**0.593**	
LV scores - FA	0.795				1.808	IBT1	0.806				1.904
LV scores - L	0.858				2.188	IBT2	0.745				1.783
LV scores - M	0.768				1.626	IBT3	0.801				1.803
LV scores - S	0.760				1.504	IBT4	0.714				1.554
						IBT5	0.816				2.116
						IBT6	0.732				1.733

CM		0.855	0.896	0.633	**IBB**		0.827	0.878	0.591
CM1	0.800				1.884	IBB1	0.767		1.642
CM2	0.811				1.947	IBB2	0.780		1.771
CM3	0.773				1.693	IBB3	0.805		1.766
CM4	0.778				1.751	IBB4	0.759		1.594
CM5	0.815				1.944	IBB5	0.732		1.511

As depicted in Table 9, the results indicate the evaluation of discriminant validity for the latent variables in the model using the Heterotrait-Monotrait (HTMT) criterion correlation. All HTMT values fall below the threshold of 0.85, suggesting that all observed variables attain discriminant validity

Table 9. Heterotrait-Monotrait (HTMT) criterion correlation of second-order variables

	CM	IBB	IBT	MM	IBT $\times$ CM
CM					
IBB	0.485				
IBT	0.379	0.329			
MM	0.796	0.498	0.475		
IBT $\times$ CM	0.088	0.155	0.091	0.085	

4-6- Structural Model Results

To examine the structural model, the authors utilized the bootstrap method with a sample size of 10,000. Following the guidelines outlined by Chin (1998) [85] and Hair et al. (2022) [82], the authors evaluated the coefficient of determination (R^2), statistical significance, and relationships among path coefficients. The results presented in Table 10 demonstrate that all path coefficients within the model are statistically significant, as indicated by the 95% confidence intervals. Importantly, the confidence intervals do not include the value 0. Furthermore, the p-values for the relationships are all below 0.05, providing strong support for all relationships.

Table 10. Path coefficients of the hypotheses

Hypotheses	Relationship	β	Sample mean	Confidence intervals	Standard deviation	T statistic	P-value	VIF	Conclusion
				Direct effect					
H1	MM $\Rightarrow$ CM	0.661	0,662	[0.588 – 0.728]	0.036	18.53	0.000	1.000	Supported
H2	CM $\Rightarrow$ IBB	0.356	0.359	[0.275 – 0.440]	0.042	8.424	0.000	1.121	Supported
H4	IBT $\Rightarrow$ IBB	0.167	0.172	[0.066 – 0.272]	0.053	3.164	0.002	1.122	Supported
				Indirect effect					
H3	MM $\Rightarrow$ CM $\Rightarrow$ IBB	0.236	0.238	[0.177 – 0.301]	0.032	7.413	0.000		Supported
				Moderator effect					
H5	IBT $\times$ CM $\Rightarrow$ IBB	0.121	0.121	[0.040 – 0.205]	0.042	2.876	0.004	1.001	Supported

R^2 adjusted:

$R^2_{CM} = 0.436$; $R^2_{IBB} = 0.208$

f^2:

$f^2_{CM \Rightarrow IBB} = 0.144$; $f^2_{IBT \Rightarrow IBB} = 0.032$; $f^2_{MM \Rightarrow CM} = 0,778$; $f^2_{IBT \times CM \Rightarrow IBB} = 0.023$

Based on the findings in Table 10, the standardized Beta coefficients reveal the following direct relationships: MM $\Rightarrow$ CM (0.661), CM $\Rightarrow$ IBB (0.356), and IBT $\Rightarrow$ IBB (0.167). These results indicate that customers' mood and impulsive buying traits have a positive and direct impact on consumers' impulsive buying behavior. This suggests that elevated mood and high purchase impulsivity are associated with increased impulsive buying behavior. Therefore, hypotheses H1, H2, and H4 are supported. Additionally, the standardized beta coefficient for the intermediate relationship between MM $\Rightarrow$ CM $\Rightarrow$ IBB is 0.236, supporting hypothesis H3, which suggests the mediating role of customers' moods. Moreover, the moderating role of buying impulsiveness in the relationship between CM $\Rightarrow$ IBB is significant, with a standardized β value of 0.121. Thus, hypothesis H5 is supported, indicating that high impulse buying intensifies the influence of CM $\Rightarrow$ IBB. In summary, the PLS-SEM model results confirm three direct effects, one indirect effect, and one moderating effect (Figure 5).
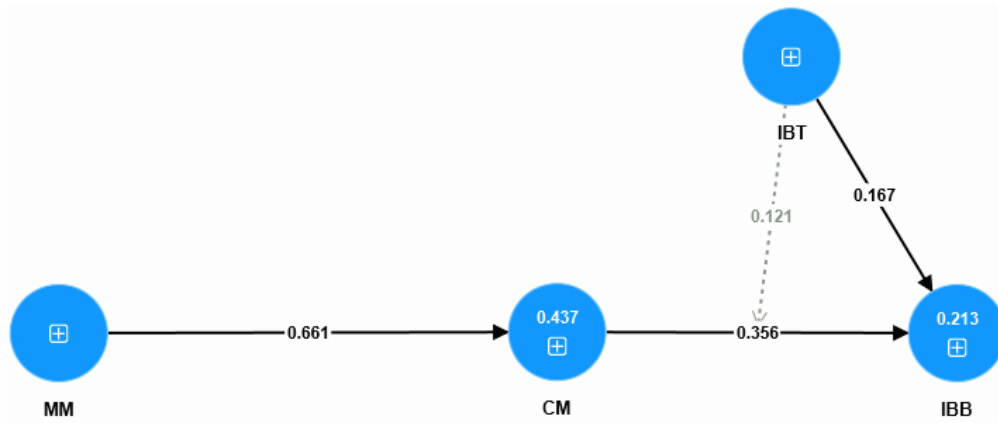
Figure 5. Structural Equation Modelling

According to Hair et al. (2022) [82], the influence of independent factors on dependent factors (f^2) can range from weak (0.02) to strong (above 0.35). As demonstrated in Table 10, multi-sensory marketing exhibits a robust impact on customers' moods (f^2 MM => CM = 0.778). Conversely, customers' moods and impulsive buying traits exert a weak influence on impulsive buying behavior (f^2 CM => IBB = 0.144; f^2 IBT => IBB = 0.032). Furthermore, purchasing impulsivity weakly moderates the relationship between customers' mood and consumer impulsive purchasing behavior (f^2 IBT x CM => IBB = 0.023). This outcome aligns with the standardized beta coefficients discussed earlier.

H1: Multi-sensory marketing has a positive and direct impact on customers' mood.

H2: Customers' moods positively influence impulsive buying behavior.

H3: Customers' moods act as a mediator in the relationship between multi-sensory marketing and customer-impulsive buying behavior.

H4: Impulsive buying traits directly enhance impulsive buying behavior.

H5: Impulsive buying traits moderate the relationship between customers' moods and impulsive buying behavior, such as higher impulsive buying traits will increase the impact of customers' moods on impulsive buying behavior

Figure 6 shows the moderating effect of impulsive buying traits (IBT) on the relationship between customers' mood (CM) and impulsive buying behavior (IBB). With the IBT at +1 standard deviation, the impact of CM on IBB is higher than IBT at mean (around 3) or IBT at - 1 standard deviation.
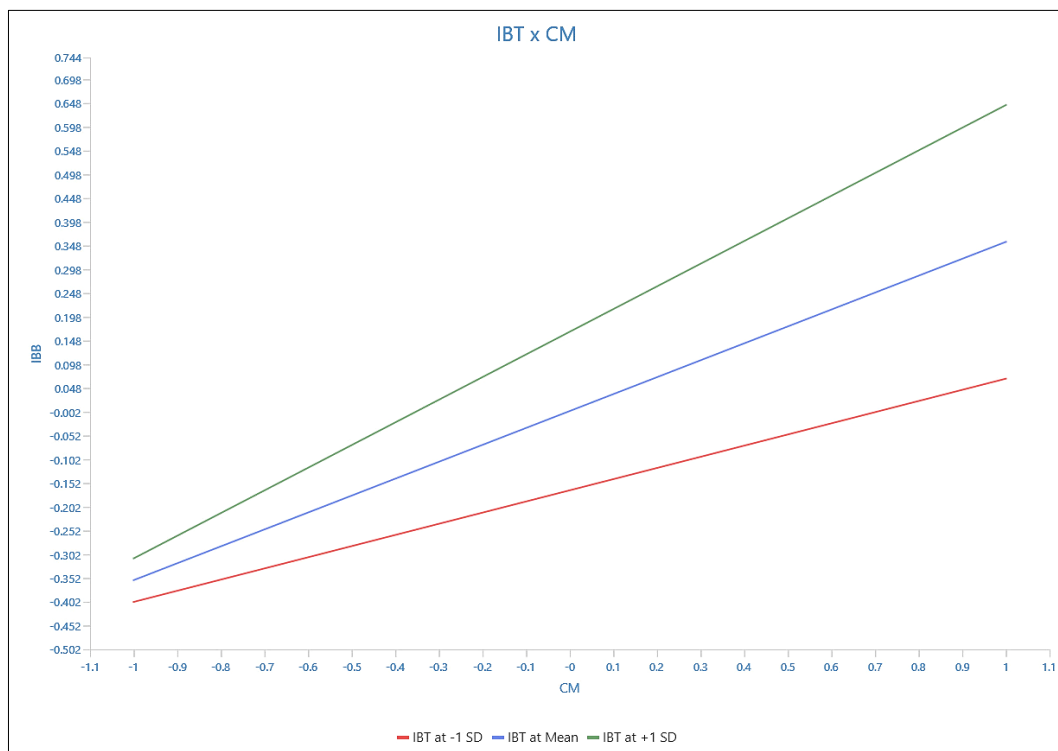

Figure 6. IBT moderates CM to IBB

4-7- Predictive Capability of the Model

According to Shmueli et al. (2019) [86], a Q² value exceeding 0 indicates predictive relevance within the model. Subsequently, the next step involves assessing PLS_RMSE or PLS_MAE in PLSpredict. Table 11 reveals that the Q² values for all observed variables, CM and IBB, surpass 0, signifying the model's suitability for prediction. The study opted for the PLS-SEM_RMSE index for analysis due to the normal distribution observed in the MV PLS-SEM chart. Out of 10 observed variables, 6 exhibit a PLS-SEM_RMSE index lower than LM_RMSE. Thus, the proposed model demonstrates average predictive capability.

Table 11. Prediction power of the model

	Q²predict	PLS-SEM_RMSE	LM_RMSE
CM1	0.299	0.696	0.708
CM2	0.279	0.708	0.717
CM3	0.267	0.719	0.726
CM4	0.232	0.684	0.687
CM5	0.289	0.702	0.702
IBB1	0.072	**0.746**	0.744
IBB2	0.092	**0.790**	0.773
IBB3	0.132	**0.713**	0.690
IBB4	0.103	**0.760**	0.745
IBB5	0.087	0.782	0.787

4-8- Discussion

The extant findings lend robust support to H1, evincing that multi-sensory marketing exerts a positive and direct influence on customers' moods, with a standardized beta coefficient of 0.661. Concomitantly, H2 is corroborated, revealing that customers' mood (CM) positively and directly affects impulsive buying behavior, with a standardized beta coefficient of 0.356. These results cohere with prior studies undertaken by Changa et al. (2011) [75], Tariq Khan et al. (2015) [87], and Febrilia & Warokka (2021) [60], suggesting that enhanced customer mood correlates with heightened impulsive purchasing propensity. Moreover, this result is consistent with the research of Kulkarni (2020) [58], Amelia & Ronald (2021) [57], and Watang & Miswanto (2022) [59], who believe that the consumer's mood factor is the most important psychological condition in stimulating impulsive buying behavior. Febrilia & Warokka (2021) [60] have also shown that consumers' mood is an influencing factor leading to spontaneous decisions to buy products in online stores.

Furthermore, H3 is substantiated, indicating that customers' mood (CM) mediates the relationship between multi-sensory marketing (MM) and consumer impulsive buying behavior (IBB), with a normalized beta coefficient of 0.236. These findings align with the Stimulus - Organism - Response (S-O-R) model propounded by Russell & Mehrabian (1974) [14], which underscores the mediating role of customers' mood in the store environment-consumer behavior nexus. Crucially, the results also cohere with the insights on sensory marketing proffered by Solomon (2017) [88], which have hitherto eluded scholarly scrutiny. The findings of this investigation align seamlessly with the proposals proffered by the scholars Ulfa Rantelina et al. (2023) [65], and Putra & Rahanatha (2023) [66].

Moreover, H4 is confirmed, implying that impulsive buying traits (IBT) exert a positive and direct impact on impulsive buying behavior, with a standardized beta coefficient of 0.167. This finding aligns with previous research conducted by Lin & Chuan (2013) [70] and Meng et al. (2019) [71], suggesting that heightened impulsive buying traits correlate with a greater propensity for impulsive purchasing.

Lastly, H5 is supported by the standardized beta coefficient of 0.121, indicating that impulsive buying traits moderate the relationship between customers' mood and impulsive buying behavior. The research findings presented are consistent with the scholarly works of Changa et al. (2011) and Mishra et al. (2014) [75, 76]. Moreover, the current result offers a novel perspective, suggesting that impulsive buying tendencies substantially impact the relationship between mood and impulsive purchasing behavior.

5- Conclusion and Implications

5-1- Conclusion

The present study sought to elucidate the interplay between multi-sensory marketing, consumers' emotional states, impulsive purchasing proclivities, and impulsive buying behavior. The key empirical findings are as follows:

Firstly, the data indicates that customers' prevailing mood holds the most substantial influence on their impulsive purchasing conduct ($\beta = 0.356$), with purchasing impulsivity also demonstrating a notable effect ($\beta = 0.167$). Secondly, multi-sensory marketing strategies were found to exert a significant impact on customers' affective states ($\beta = 0.661$). Furthermore, mood was observed to function as a mediating mechanism in the relationship between multi-sensory marketing and impulsive buying behavior ($\beta = 0.236$). Additionally, impulsive buying traits were found to moderate the association between mood and impulsive buying behavior ($\beta = 0.121$).

In sum, this comprehensive investigation offers a nuanced perspective on the role of multi-sensory marketing in shaping impulsive shopping behavior. From a practical standpoint, the results provide valuable insights to assist commercial entities, retailers, and supermarkets in cultivating impulse purchases and boosting sales. Academically, the research reinforces the salience of S-O-R framework within the retail domain and lays the groundwork for future inquiries into the antecedents of consumers' impulsive buying propensities.

5-2- Managerial Implications

Drawing from the study's results, the authors put forward practical recommendations for businesses, retailers, and other entities seeking to augment consumer impulsive buying behavior. Retail managers can allocate resources and adopt multi-sensory marketing strategies, integrating diverse elements like color, lighting, music, scent, and store layout. By doing so, they can construct a distinctive and multi-faceted shopping experience that not only creates a lasting impact but also evokes excitement among customers.

Regarding aesthetics, stores should prioritize and enhance this aspect by creating decorative items that bring a sense of opulence and excitement to the shopping experience. Additionally, they should pay careful attention to visually appealing store landscapes that align with festive occasions such as Christmas, Lunar New Year, Halloween, or Valentine's Day. Stores can also consider incorporating handmade products or recycled items to enhance the uniqueness of the store space. Furthermore, creating a distinctive shopping environment that caters to customer preferences can be achieved by utilizing harmonious lighting, adjusting brightness levels, and optimizing lighting angles. Lastly, improving the color scheme within the store plays a crucial role in attracting and encouraging customers to make purchases. Store owners can strategically use colors that align with their brand identity to heighten the aesthetic appeal of the store and create a visually pleasing environment.

Regarding the layout aspect, store managers can ensure a logical and organized arrangement of product catalog areas. This can be achieved by categorizing products based on their respective groups, types, or functions, which facilitates customers in their search and selection process. Additionally, stores can strategically position complementary products on hanging shelves or in areas adjacent to the main product to attract customers' attention and increase sales. Visually appealing product displays, along with clear signs and instructions, further enhance the shopping experience and serve as focal points for store managers aiming to boost sales. Furthermore, stores can periodically modify their layouts, introducing fresh elements every one to two months to offer customers something new and engaging. It is also crucial for stores to maintain clean, tidy, and well-organized display shelves at all times. Additionally, signage, advertising, and information boards should be positioned at eye level to ensure easy visibility, thereby stimulating shopping demand.

When considering olfactory factors, stores should give careful attention to the ambiance created by scents, as any negative impact on customers' moods should be promptly addressed. Stores can choose fragrances that are suitable for their specific establishment, such as cinnamon, lavender, or herbal fragrances for supermarkets. This helps to cultivate an enjoyable atmosphere that contributes to a pleasant shopping experience. Additionally, stores can enhance the overall aesthetic appeal by strategically placing decorative pots and miniature flower arrangements in prominent areas and aisles, creating a refreshing green environment accompanied by a pleasant and comforting aroma.

Regarding the music component, stores should select music that matches the store's aesthetic and contributes to a calm and comfortable atmosphere for shoppers. To avoid monotony and introduce a sense of freshness during the shopping experience, periodically changing the music selection is recommended. Additionally, adjusting the volume and incorporating music that appeals to the store's primary customer base, particularly individuals aged 18 to 35, can effectively encourage impulsive buying behavior within this target demographic.

Furthermore, customer emotions have the capacity to impact impulsive buying behavior. However, the inclination to engage in impulsive purchases is also influenced by internal factors specific to the customer, such as impulsive buying characteristics. The intensity of these traits directly correlates with the extent to which customers' moods affect impulsive buying behavior. As a result, it is crucial for managers to recognize the significance of understanding customer spontaneity to optimize their business strategies. Managers can employ communication tactics, such as providing discounts on prices or distributing in-store vouchers, to enhance this sense of spontaneity.

5-3- Theoretical Significance

There is currently a lack of comprehensive research on multi-sensory marketing and its impact on impulsive buying behavior, which is an area of great interest for marketers. This study aims to fill this gap by not only emphasizing but also exploring the influence of multi-sensory marketing, including factors such as facility aesthetics, layout, music, and scent, on impulse purchases while previous studies can only cover some parts of sensory marketing. This study not only conceptualizes the role of multi-sensory marketing through in-store factors (facility aesthetics, layout, music, scent) that influence impulsive buying behavior but also reaffirm and expand the S-O-R model by adding multi-sensory marketing factor.

Furthermore, in academic research, there has been an increasing focus on consumer's purchasing impulsivity and its role across different domains. However, the moderating effect of buying impulsiveness traits in the relationship between mood and impulsive shopping behavior has received limited attention from researchers [75, 76]. While consumers' emotional responses to a product can trigger impulsive purchase intentions, the actual occurrence of impulse buying depends on the consumer's level of impulsivity. Therefore, the authors have expanded the scope of their research to examine the role of impulsivity and provide insights into how consumers engage in impulsive shopping behavior based on this moderating factor. In conclude, adding consumers' buying impulsiveness traits can also solve the gap between organism - behavior in S-O-R model [12].

5-4- Limitations

This study has certain limitations that can serve as opportunities for future research to enhance the understanding of consumers' impulsive purchasing behavior. Firstly, the research was conducted within a short timeframe and focused only in Vietnam, which may limit the generalizability of the findings to consumers nationwide. Secondly, the collection of primary data relied on a questionnaire survey administered through Google Forms, which could potentially impact the breadth and reliability of the data sample. Thirdly, the study primarily examined mood as a mediator in the relationship between multi-sensory marketing and impulsive buying behavior. Future researchers could explore cognitive factors to further elucidate this relationship. Fourthly, due to time constraints, not all variables in the research model were thoroughly analyzed. For example, the investigation of multi-sensory marketing only focused on three senses (sight, hearing, and smell), neglecting other senses such as taste and touch. A more comprehensive analysis of these variables could provide a more nuanced and detailed understanding of the phenomenon. Finally, according to Bhakat & Muruganantham (2013) [89], impulsive shopping behavior results from the interaction of internal and external stimuli. However, in this study, the authors are only interested in the internal stimulation aspect, and these factors are within the control of managers and marketers by the initial research goal of proposing managerial implications for businesses and retail stores to devise marketing strategies that effectively attract and encourage customers' impulsive shopping behavior. Future research should explore the impacts of external stimuli on impulsive buying behavior to provide a comprehensive understanding.

6- Declarations

6-1- Author Contributions

6-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6-3- Funding

6-4- Acknowledgements

6-5- Institutional Review Board Statement

Not applicable.

6-6- Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

6-7- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

7- References

[1] Statista. (2024). Annual growth rate of retail sales of consumer goods and services in Vietnam from 2019 to 2023, with a forecast for 2024. Available online: https://www.statista.com/statistics/1411670/vietnam-annual-growth-of-retail-sales-of-consumer-goods-and-services/ (accessed on September 2024).

[2] Bellenger, D. N., Robertson, D. H., & Hirschman, E. C. (1978). Impulse buying varies by product. Journal of advertising research, 18(6), 15-18.

[3] Choudhary, S. (2014). Study of impulse buying behavior of consumers. International Journal of Advance Research in Computer Science and Management Studies, 2(9), 1-4.

[4] Temaja, I., Rahanatha, G., & Yasa, N. (2015). The Influence of Fashion Involvement, Store Atmosphere and Sales Promotion on Impulse Buying at Matahari Department Store in Denpasar City. Udayana University Management E-Journal, 4(6), 243654.

[5] Mohan, G., Sivakumaran, B., & Sharma, P. (2013). Impact of store environment on impulse buying behavior. European Journal of Marketing, 47(10), 1711–1732. doi:10.1108/EJM-03-2011-0110.

[6] Goel, P., Garg, A., Sharma, A., & Rana, N. P. (2024). Impact of Sensory Perceptions on the Urge to Buy Impulsively. Journal of Computer Information Systems, 64(4), 469–485. doi:10.1080/08874417.2023.2224748.

[7] Yale School of Management. (2022). Five Insights from Multi-Sensory Marketing. Yale Center for Customer Insights | Yale University, Connecticut, United States. Available online: https://som.yale.edu/story/2022/five-insights-multi-sensory-marketing (accessed on August 2024).

[8] Gelder, K. (2023). Main online impulse purchases worldwide 2022, by gender. Statista, Hamburg, Germany. Available online: https://www.statista.com/statistics/1308151/online-impulse-purchases-worldwide-gender/ (accessed on September 2024).

[9] Savić, M., Perić, N., & Savić, R. (2020). Multi-sensory marketing. Ekonomski Izazovi (Economic Challenges), 9(17), 45–57. doi:10.5937/ekoizazov2017045s.

[10] Viegas, C., Agapito, D., & Pinto, P. (2023). Sensory marketing: The purpose of sensory stimuli in consumer behaviour in the context of the retail environment. Measuring Consumer Behavior in Hospitality for Enhanced Decision Making, 161–189. doi:10.4018/978-1-6684-6607-0.ch008.

[11] Chen, Y., & Yue, W. (2023). The Influence of Marketing Stimuli and Contextual Factors on Consumers' Intention to Make Impulse Purchases in Live E-Commerce. E-Business. Digital Empowerment for an Intelligent Future, WHICEB 2023, Lecture Notes in Business Information Processing, 480. Springer, Cham, Switzerland. doi:10.1007/978-3-031-32299-0_12.

[12] Sagha, M. A., Seyyedamiri, N., Foroudi, P., & Akbari, M. (2022). The One Thing You Need to Change Is Emotions: The Effect of Multi-Sensory Marketing on Consumer Behavior. Sustainability (Switzerland), 14(4), 1–18. doi:10.3390/su14042334.

[13] Chathuranga, B. T. K., & Lakshika, V. G. P. (2019). Multi-Sensory Brand Experience and Impulse Buying Tendency: An Exploration of Sri Lankan Supermarkets. International Journal of Trend in Scientific Research and Development, 3(5), 2497-2501.

[14] Russell, J. A., & Mehrabian, A. (1974). Distinguishing anger and anxiety in terms of emotional response factors. Journal of Consulting and Clinical Psychology, 42(1), 79–83. doi:10.1037/h0035915.

[15] Irimia-Diéguez, A., Liébana-Cabanillas, F., Blanco-Oliver, A., & Lara-Rubio, J. (2023). What drives consumers to use P2P payment systems? An analytical approach based on the stimulus–organism–response (S-O-R) model. European Journal of Management and Business Economics. doi:10.1108/EJMBE-12-2022-0374.

[16] Chin, C. H., Wong, W. P. M., Kiu, A. L. H., & Thong, J. Z. (2023). Intention to Use Virtual Reality in Sarawak Tourism Destinations: A Test of Stimulus-Organism-Response (S-O-R) Model. Geojournal of Tourism and Geosites, 47(2), 551–562. doi:10.30892/gtg.47223-1055.

[17] Chudhery, M. A. Z., Safdar, S., Huo, J., Rehman, H. U., & Rafique, R. (2023). Proposing and Empirically Investigating a Mobile-Based Outpatient Healthcare Service Delivery Framework Using Stimulus-Organism-Response Theory. IEEE Transactions on Engineering Management, 70(8), 2668–2681. doi:10.1109/TEM.2021.3081571.

[18] Jiang, P. (2014). The Influence of Store Atmosphere on Shoppers' Impulse Purchasing Behavior. BUSN 39 Degree Project in Global Marketing, School of Economics and Management, Lund University, Lund, Sweden. Available online: https://lup.lub.lu.se/student-papers/record/4499657/file/4499659.pdf (accessed on September 2024).

[19] Stern, H. (1962). The Significance of Impulse Buying Today. Journal of Marketing, 26(2), 59. doi:10.2307/1248439.

[20] Chan, T. K., Cheung, C. M., & Lee, Z. W. (2017). The state of online impulse-buying research: A literature analysis. Information & Management, 54(2), 204-217. doi:10.1016/j.im.2016.06.001.

[21] Rook, D. W., & Gardner, M. P. (1993). In the mood: Impulse buying's affective antecedents. Research in consumer behavior, 6(7), 1-28.

[22] Dennis, R., & Hoch, S. J. (1985). Consuming impulses. Advances in Consumer Research, 12(1), 23-27.

[23] Rook, D. W. (1987). The Buying Impulse. Journal of Consumer Research, 14(2), 189. doi:10.1086/209105.

[24] Donovan, R. (1994). Store atmosphere and purchasing behavior. Journal of Retailing, 70(3), 283–294. doi:10.1016/0022-4359(94)90037-x.

[25] Beatty, S. E., & Elizabeth Ferrell, M. (1998). Impulse buying: Modeling its precursors. Journal of Retailing, 74(2), 161–167. doi:10.1016/s0022-4359(98)90009-4.

[26] Sharma, P., Sivakumaran, B., & Marshall, R. (2010). Impulse buying and variety seeking: A trait-correlates perspective. Journal of Business Research, 63(3), 276–283. doi:10.1016/j.jbusres.2009.03.013.

[27] Verhagen, T., & Van Dolen, W. (2011). The influence of online store beliefs on consumer online impulse buying: A model and empirical application. Information and Management, 48(8), 320–327. doi:10.1016/j.im.2011.08.001.

[28] Cho, J., Ching, G. S., & Luong, T.-H. (2014). Impulse buying behavior of Vietnamese consumers in supermarket setting. International Journal of Research Studies in Management, 3(2), 33-50. doi:10.5861/ijrsm.2014.775.

[29] Krishna, A., & Elder, R. S. (2010). The gist of gustation: An exploration of taste, food, and consumption. Sensory marketing: Research on the sensuality of products. Routledge/Taylor & Francis Group, Milton Park, United Kingdom.

[30] Hirschman, E. C., & Holbrook, M. B. (1982). Hedonic Consumption: Emerging Concepts, Methods and Propositions. Journal of Marketing, 46(3), 92. doi:10.2307/1251707.

[31] Soares, D., & Niemiller, M. L. (2013). Sensory adaptations of fishes to subterranean environments. BioScience, 63(4), 274–283. doi:10.1525/bio.2013.63.4.7.

[32] Cornil, Y., & Chandon, P. (2016). Pleasure as an ally of healthy eating? Contrasting visceral and Epicurean eating pleasure and their association with portion size preferences and wellbeing. Appetite, 104, 52–59. doi:10.1016/j.appet.2015.08.045.

[33] Joy, A., & Sherry, J. F. (2003). Speaking of Art as Embodied Imagination: A Multisensory Approach to Understanding Aesthetic Experience. Journal of Consumer Research, 30(2), 259–282. doi:10.1086/376802.

[34] Krishna, A., Lwin, M. O., & Morrin, M. (2010). Product scent and memory. Journal of Consumer Research, 37(1), 57–67. doi:10.1086/649909.

[35] Lwin, M. O., & Morrin, M. (2012). Scenting movie theatre commercials: The impact of scent and pictures on brand evaluations and ad recall. Journal of Consumer Behaviour, 11(3), 264–272. doi:10.1002/cb.1368.

[36] Diţoiu, M.-C., & Căruntu, A.-L. (2014). Sensory Experiences Regarding Five-dimensional Brand Destination. Procedia - Social and Behavioral Sciences, 109, 301–306. doi:10.1016/j.sbspro.2013.12.461.

[37] Raghubir, P., & Greenleaf, E. A. (2006). Ratios in proportion: What should the shape of the package be? Journal of Marketing, 70(2), 95–107. doi:10.1509/jmkg.70.2.95.

[38] Spence, C., Puccinelli, N. M., Grewal, D., & Roggeveen, A. L. (2014). Store atmospherics: A multisensory perspective. Psychology and Marketing, 31(7), 472–488. doi:10.1002/mar.20709.

[39] van Rompay, T. J. L., Fransen, M. L., & Borgelink, B. G. D. (2014). Light as a feather: Effects of packaging imagery on sensory product impressions and brand evaluation. Marketing Letters, 25(4), 397–407. doi:10.1007/s11002-013-9260-3.

[40] Shabgou, M., & Daryani, S. M. (2014). Towards the sensory marketing: stimulating the five senses (sight, hearing, smell, touch and taste) and its impact on consumer behavior. Indian Journal of Fundamental and Applied Life Sciences, 4(1), 573-581.

[41] Kim, K. (2019). An examination of the relationship between multisensory marketing, emotion, memory, and post-purchase behavior in the hotel industry. Ph.D. Thesis, Pukyong National University, Busan, South Korea.

[42] Şahiner, F. (2016). Design factors: the impact of facility aesthetics and layout accessibility on customers' emotions and behavioral intentions in hotel lobbies. Master Thesis, Bilkent Universitesi, Ankara, Türkiye.

[43] Ndengane, R. M., Mason, R. B., & Mutize, M. (2021). The influence of store atmospherics on customers' satisfaction at selected South African retail outlets. Innovative Marketing, 17(1), 26–39. doi:10.21511/IM.17(1).2021.03.

[44] Smeets, M. A. M., Schifferstein, H. N. J., Boelema, S. R., & Lensvelt-Mulders, G. (2008). The odor awareness scale: A new scale for measuring positive and negative odor awareness. Chemical Senses, 33(8), 725–734. doi:10.1093/chemse/bjn038.

[45] Isaac, N., Keelson, S. A., & Yiadom, E. B. (2023). The Effect of Multi-Sensory Marketing on Non-Economic Performance of Ghana's Restaurants. OALib, 10(06), 1–31. doi:10.4236/oalib.1109655.

[46] Lindstrom, M. (2006). Brand Sense: How to Build Powerful Brands Through Touch, Taste, Smell, Sight and Sound. Strategic Direction, 22(2), 1-6. doi:10.1108/sd.2006.05622bae.001.

[47] Yang, K. (2023). The influence of sensory marketing on customer satisfaction and its behavioral intention. Advances in Economics and Management Research, 5(1), 130. doi:10.56028/aemr.5.1.130.2023.

[48] Park, N. K., & Farr, C. A. (2007). The effects of lighting on consumers' emotions and behavioral intentions in a retail environment: A cross-cultural comparison. Journal of Interior Design, 33(1), 17–32. doi:10.1111/j.1939-1668.2007.tb00419.x.

[49] Mohan, G., Sivakumaran, B., & Sharma, P. (2013). Impact of store environment on impulse buying behavior. European Journal of Marketing, 47(10), 1711–1732. doi:10.1108/EJM-03-2011-0110.

[50] Biswas, D., Szocs, C., Chacko, R., & Wansink, B. (2017). Shining light on atmospherics: How ambient light influences food choices. Journal of Marketing Research, 54(1), 111–123. doi:10.1509/jmr.14.0115.

[51] Blizek, W., & Berlyne, D. E. (1973). Aesthetics and Psychobiology. The Journal of Aesthetics and Art Criticism, 31(4), 553. doi:10.2307/429334.

[52] Scherer, K. R. (1984). Emotion as a multicomponent process: A model and some cross-cultural data. Review of Personality & Social Psychology, 5, 37–63.

[53] Osman, S., Ong, F. S., Othman, M. N., & Khong, K. W. (2014). The mediating effect of mood on in-store behaviour among Muslim shoppers. Journal of Islamic Marketing, 5(2), 178–197. doi:10.1108/JIMA-01-2013-0005.

[54] Michon, R., Chebat, J. C., & Turley, L. W. (2005). Mall atmospherics: The interaction effects of the mall environment on shopping behavior. Journal of Business Research, 58(5), 576–583. doi:10.1016/j.jbusres.2003.07.004.

[55] Chebat, J. C., & Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories. Journal of Business Research, 56(7), 529–539. doi:10.1016/S0148-2963(01)00247-8.

[56] Youn, S., & Faber, R. J. (2000). Impulse buying: Its relation to personality traits and cues. Advances in Consumer Research, 27(1), 179–185.

[57] Amelia, A., & Ronald, R. (2021). Importance of Store Environment in Indonesia Modern Retail to Elevate Impulse Buying Behavior. Review of Integrative Business and Economics Research, 10(3), 117–131.

[58] Kulkarni, S. R. (2020). Effect of Covid-19 on the Shift in Consumer Preferences with Respect to Shopping Modes (Offline/Online) for Groceries: An Exploratory Study. International Journal of Management, 11(10), 581–590. doi:10.34218/IJM.11.10.2020.055.

[59] Watang, K. C. C., & Miswanto, M. (2022). Mood Management as Mediator in Consumer Motivation and Impulsive Buying Relationship. Kinerja, 26(1), 137–150. doi:10.24002/kinerja.v26i1.5543.

[60] Febrilia, I., & Warokka, A. (2021). Consumer traits and situational factors: Exploring the consumer's online impulse buying in the pandemic time. Social Sciences and Humanities Open, 4(1), 100182. doi:10.1016/j.ssaho.2021.100182.

[61] Lund, C. (2015). Selling through the senses: Sensory appeals in the fashion retail environment. Fashion Practice, 7(1), 9–30. doi:10.2752/175693815X14182200335619.

[62] Liégeois, M., & Rivera, C. (2011). Sensory marketing on the natural cosmetics market: The impact on generation X and generation Y. School of Business And Engineering, Halmstad, Sweden.

[63] 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. doi:10.1016/j.jcps.2011.08.003.

[64] Hussain, A., Khan, T., & Khan, S. (2021). Effect of store environmental and individual factors on impulse buying behaviour of Pakistani consumers. Sir Syed Journal of Education & Social Research, 4(1), 416-430. doi:10.36902/sjesr-vol4-iss1-2021(416-430).

[65] Ulfa Rantelina, N., Andiyani, R., & Dwanita Widodo, Z. (2023). The Effect of Bonus Pack, Shopping Lifestyle, and Store Atmosphere on Impulse Buying Consumers of Matahari Solo Grand Mall. International Journal of Business, Law, and Education, 4(1), 70–77. doi:10.56442/ijble.v4i1.130.

[66] Putra, A. P., & Rahanatha, G. B. (2023). The Influence of Store Environment on Impulse Buying is Mediated by Positive Emotions. E-Jurnal Ekonomi Dan Bisnis Universitas Udayana, 337. doi:10.24843/eeb.2023.v12.i02.p19.

[67] Pratama K, R., & Roostika, R. (2023). The influence of consumer traits on impulsive buying. International Journal of Business Ecosystem & Strategy (2687-2293), 5(2), 12–20. doi:10.36096/ijbes.v5i2.391.

[68] Gantulga, U., & Dashrentsen, D. (2023). Factors Influence Impulsive Buying Behavior. Scientific Journal of the Humanitas University of Management, 24(1), 9–25. doi:10.5604/01.3001.0053.4041.

[69] Ahmadova, E., & Nabiyeva, A. (2024). Analysis of the impulsive buyer behavior: empirical evidences from Azerbaijan. Journal of Islamic Marketing, 15(2), 314–337. doi:10.1108/JIMA-10-2022-0271.

[70] Lin, J., & Chuan, C. H. (2013). A Study on Youth Online Impulsive Purchase: The Relationship between Individual Difference, Shopping Environment, Emotion Response and Purchase. Journal of Creative Communications, 8(2–3), 209–229. doi:10.1177/0973258613512571.

[71] Meng, F., Zhang, P., Li, H., & So, K. K. F. (2019). Modeling precursors of impulsive tourist shopping behavior: Evidence from long-haul Chinese outbound tourists. International Journal of Tourism Research, 21(3), 344–358. doi:10.1002/jtr.2266.

[72] Sokić, K., Korkut, D., & Šestanović, A. (2020). Relationship between Impulsivity, Value Orientations and Impulsive Buying. Managing Global Transitions, 18(3), 195–210. doi:10.26493/1854-6935.18.195-210.

[73] Chen, J. V., Ha, Q. A., & Vu, M. T. (2023). The Influences of Virtual Reality Shopping Characteristics on Consumers' Impulse Buying Behavior. International Journal of Human-Computer Interaction, 39(17), 3473–3491. doi:10.1080/10447318.2022.2098566.

[74] Cuandra, F. (2022). Impulsiveness in Online Era: The Role of Utilitarian and Hedonic Value on Impulsiveness and Impulse Buying Behavior of Batam Community. Inovbiz: Jurnal Inovasi Bisnis, 10(1), 89. doi:10.35314/inovbiz.v10i1.2414.

[75] Changa, H. J., Eckmanb, M., & Yanb, R. N. (2011). Application of the stimulus-organism-response model to the retail environment: The role of hedonic motivation in impulse buying behavior. International Review of Retail, Distribution and Consumer Research, 21(3), 233–249. doi:10.1080/09593969.2011.578798.

[76] Mishra, H. G., Sinha, P. K., & Koul, S. (2014). Buying impulsive trait. Journal of Management Research, 14(2), 109-120.

[77] Hiebler-Ragger, M., Fuchshuber, J., Dröscher, H., Vajda, C., Fink, A., & Unterrainer, H. F. (2018). Personality influences the relationship between primary emotions and religious/Spiritual well-being. Frontiers in Psychology, 9, 370. doi:10.3389/fpsyg.2018.00370.

[78] Kamaruddin, N., Wahab, A., Alarabi, K. F., & Abut, H. (2020). 5 Neurophysiological Driver Behavior Analysis. Vehicles, Drivers, and Safety, 2, 67–86. doi:10.1515/9783110669787-005.

[79] Sun, T., & Wu, G. (2011). Trait predictors of online impulsive buying tendency: A hierarchical approach. Journal of Marketing Theory and Practice, 19(3), 337–346. doi:10.2753/MTP1069-6679190307.

[80] Bank Times. (2024). City. Ho Chi Minh City: Total retail sales of goods and commercial revenue reached 1.190.407 billion VND. Vietnam.Vn, Hanoi, Vietnam. Available online: https://www.vietnam.vn/en/tp-ho-chi-minh-tong-muc-ban-le-hang-hoa-va-doanh-thu-thuong-mai-dat-1-190-407-ty-dong/ (accessed on September 2024).

[81] UEH News. (2023). Ho Chi Minh City Bureau of Statistics 2023 Socio-Economic Bulletin. Available online: https://ueh.edu.vn/en/news/macroeconomic-report-of-ho-chi-minh-city-part-1-the-overview-of-the-economies-of-the-world-vietnam-and-ho-chi-minh-city-in-2023-71295 (accessed on August 2024).

[82] Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Classroom Companion: Business. Springer International Publishing, Springer, Cham, Switzerland. doi:10.1007/978-3-030-80519-7.

[83] Comrey, A. L., & Lee, H. B. (2013). A First Course in Factor Analysis. Psychology Press, New York, United States. doi:10.4324/9781315827506.

[84] Cooper, B., Eva, N., Zarea Fazlelahi, F., Newman, A., Lee, A., & Obschonka, M. (2020). Addressing common method variance and endogeneity in vocational behavior research: A review of the literature and suggestions for future research. Journal of Vocational Behavior, 121, 103472. doi:10.1016/j.jvb.2020.103472.

[85] Chin, W. W. (1998). The partial least squares approach to structural equation modeling. Modern methods for business research/Lawrence Erlbaum Associates, Taylor & Francis, Milton Park, United Kingdom.

[86] Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. European Journal of Marketing, 53(11), 2322–2347. doi:10.1108/EJM-02-2019-0189.

[87] Khan, M. T., Humayun, A. A., & Sajjad, M. (2015). Factors Affecting Impulse Buying and Percentage of Impulse Buying in Total Purchasing. International Journal of Information, Business and Management, 7(1), 254–268.

[88] Solomon, M. R. (2020). Consumer behavior: Buying, having, and being. Pearson, Hoboken, United States.

[89] Bhakat, R. S., & Muruganantham, G. (2013). A Review of Impulse Buying Behavior. International Journal of Marketing Studies, 5(3), 149. doi:10.5539/ijms.v5n3p149.