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Research article

A comprehensive study on factors influencing online impulse buying behavior: Evidence from Shopee video platform

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ABSTRACT

The rapid expansion of online commerce has significantly altered consumer behavior, particularly among digitally-savvy Generation Z individuals. This research analyzes the influence of product presentation videos on online impulsive buying behaviors in this demographic, using the Shopee video platform as a case study. The study aims to investigate how various external factors, including time pressure (TP), quantity pressure (QP), economic benefits (EB), social influence (SI), visual (VS), and sound (SO), affect online impulse buying by mediating emotions of arousal (AR) and pleasure (PL). This study employed a quantitative approach, and data was collected through a Likert scale questionnaire using a non-probability sampling technique. PLS-SEM statistical analysis was utilized to assess the research model, exploring the interplay of these stimuli in shaping impulsive buying behavior on the Shopee platform, among 438 Vietnamese Generation Z. The study's results indicate significant impacts of all factors on arousal, while time pressure, quantity pressure, and economic benefits did not significantly influence pleasure. Notably, arousal and pleasure emerged as mediators shaping impulsive buying decisions among Generation Z. These findings indicate that strategic use of external factors can effectively trigger emotions, leading to impulsive buying among digital natives. This also offers valuable insights for marketers looking to enhance e-commerce strategies on platforms such as Shopee video. Marketers can trigger customers' impulsive buying by creating a sense of urgency (e.g. flash sales, limited quantities), useful online reviewing, and personalizing discounts. Additionally, using visual and sound strategies in a positive online experience can further enhance this behavior and shape preferences. This study's findings contribute to a deeper understanding of consumer behavior theories in the digital era, highlighting the intricate roles of arousal and pleasure in online impulse buying.

1. Introduction

The rise of online shopping, driven by the advent of the Internet, has experienced exponential growth. In 2024, the global e-commerce market is expected to reach 6.3 trillion USD, and it is projected that 22.6 % of total retail sales will be conducted online by 2027 [1]. This growth trajectory was further amplified by the COVID-19 pandemic [2], which disrupted traditional retail due to lockdowns and social distancing measures, prompting consumers to shift towards online platforms [3,4]. This trend is particularly

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noticeable in developing regions such as Southeast Asia, where Vietnam has seen remarkable growth in their e-commerce sectors. According to a recent analysis from the Vietnam Ministry of Industry and Trade's E-Commerce and Digital Economy Department, in 2021, the e-commerce market in Vietnam was valued at approximately 13.7 billion USD, accounting for about 6.5 % of the total retail revenue. It is estimated that this market size exceeded 20 billion USD in 2023, with an average annual growth rate of 29 % from 2020 to 2025 [5]. Among popular online shopping platforms such as Tiki, Lazada, and Shopee, Shopee has dominated the Southeast Asian e-commerce landscape, reporting 343 million monthly users in 2021 and being the most downloaded shopping app globally [6–8].

This transition to online shopping is primarily driven by Generation Z, digitally native individuals born between 1995 and 2010 [9]. Generation Z, known for their high digital connectivity, prefers digital solutions over traditional face-to-face interactions [10,11]. This generation's engagement with various technologies for communication and information consumption significantly influences their shopping behaviors and preferences [12]. The unique characteristics of Generation Z have reshaped marketing paradigms, elevating the importance of online platforms. The influence of social commerce on this generation's propensity for online impulsive buying stems from creative promotion techniques on social media platforms, which directly stimulate and motivate purchases [13].

Empirical evidence from a survey of Shopee customers reveals that Generation Z engages in online impulse buying due to the influence of product attributes and sales incentives on their behavior [14]. Research by Lina et al. [15] suggests that Generation Z's behavior on Shopee is shaped by social media, advertising strategies, and individual characteristics, which collectively influence their online impulse buying tendencies. Furthermore, video content has emerged as a predominant medium through which retailers engage with this technologically savvy cohort. Videos offer a more dynamic and immersive experience than traditional text and image content, thus significantly enhancing online product presentation and potentially increasing consumer engagement and purchase intentions [16,17].

Despite significant advancements in understanding online shopping behaviors, research on the emotional drivers reinforcing impulsive buying, especially among Generation Z, remains underexplored [18]. While previous studies have examined the influence of product presentation videos on product sales [19], attitude, purchase channel selection, and purchase intention [16,20], they have primarily focused on the urge to buy impulsively without delving into the actual impulsive buying behaviors or the emotional resonance evoked by these videos [21–23].

This research aims to address these gaps by investigating the influence of product presentation videos on Generation Z's online impulse buying behaviors, mainly focusing on Shopee video platform. The main objective is to dissect the intricate interactions between stimuli in online environments and their impact on impulse buying [24]. This research also seeks to uncover the mechanisms driving impulsive buying in digital settings, thereby enhancing consumer behavior theories and integrating digital triggers into impulse buying frameworks [25]. Specifically, the study examines the impact of external factors, including time pressure, quantity pressure, economic benefits, social influence, and visual and sound elements, on consumers' arousal and pleasure. It further explores how arousal and pleasure act as mediators influencing online impulse-buying behavior. By analyzing these dynamics, the research aims to understand how external stimuli contribute to emotional responses and subsequently affect impulsive purchasing decisions in an online context.

This research paper is unique in its comprehensive approach to understanding the emotional drivers of impulsive buying behaviors among Generation Z, with a specific focus on the impact of product presentation videos on Shopee. It explores deeper into actual impulsive buying behaviors and the emotional resonance evoked by product presentation videos. It also incorporates an analysis of external factors such as time pressure, quantity pressure, economic benefits, social influence, and visual and sound elements, providing a holistic view of the factors influencing online impulse buying.

The findings from this research are highly applicable to both marketers and e-commerce platforms. By leveraging these insights, marketers can create engaging video content specifically tailored to Generation Z's preferences, optimizing strategies on platforms like Shopee. Moreover, the research provides valuable guidance for enhancing e-commerce platform design and functionality to promote impulse purchases, thereby improving the overall online shopping experience.

2. Literature review

2.1. Time pressure

Time pressure, defined as the psychological sense of urgency in making purchase decisions swiftly, significantly stimulates interest and excitement during shopping experiences. Marketers often leverage time pressure through strategies such as flash sales or time-sensitive offers, prompting consumers to take advantage of limited-time deals promptly, as Gupta and Gentry [26] observed.

The heightened internal emotional states induced by time constraints significantly influence consumer choices. Emotions such as arousal and pleasure profoundly impact buying behavior, affecting the likelihood of impulsive purchases depending on individual variations and the intensity of the responses [27]. The arousal hypothesis suggests that the immediate need to act under time pressure heightens attention and fosters positive emotions, enriching the shopping experience. Zhu et al. [28] argue that tasks or decisions made under time pressure elicit quicker responses compared to those made with more deliberation, leading to the "mere urgency effect." This effect encourages rapid action to take advantage of opportunities, often resulting in spontaneous decisions without full consideration.

Online platforms strategically employ time-pressure tactics to promote impulsive buying, intensifying urgency through scarcity and time-sensitive prompts to expedite purchasing decisions [29]. These tactics are designed to create an environment where consumers feel compelled to act swiftly to avoid missing out on deals, thereby increasing the incidence of impulsive purchases. According to research by Dong et al. [30], time pressure manipulates the shopping environment to create a sense of urgency, enhancing emotional engagement and pleasure for consumers.

Hedonic value also plays a significant role in impulse buying by enhancing the pleasure of shopping experiences, acting as an emotional catalyst for impulsive behavior [31]. The emotional and psychological satisfaction consumers derive from shopping contributes to the hedonic value, making the shopping experience more enjoyable and engaging. This relationship underscores the importance of emotional engagement in driving impulsive buying behaviors. Hence, in line with these studies, the following hypotheses were proposed.

H1. Time pressure has a significant impact on arousal.

H2. Time pressure has a significant impact on pleasure.

2.2. Quantity pressure

Quantity pressure refers to the psychological impact on consumers when they perceive a product as limited in availability, often associated with quantity-limited promotions or product shortages. This phenomenon influences consumers' decision-making processes, increasing the perceived desirability of the product due to its restricted availability. The presence of a limited quantity heightens consumer arousal and creates a sense of urgency, leading to rushed purchasing decisions driven by the fear of missing out, which are significant drivers of impulsive buying behavior [29,32]. Research by Hamilton et al. [33] note that quantity pressure often arises from a fixed number of available units, contributing to the uncertainty of obtaining the desired item, thereby potentially eliciting impulsive actions in response to perceived scarcity. This scarcity effect taps into consumers' intrinsic fear of missing out, triggering a psychological response that prioritizes immediate acquisition over rational deliberation.

Kivetz and Zheng [34] demonstrated that consumers pursuing hedonic goals, such as pleasure, exhibited heightened motivation to purchase when confronted with limited quantity conditions, especially with utilitarian products. This quantity pressure can enhance the pleasure experienced by consumers, thereby increasing the likelihood of impulse buying behavior. The urgency created by quantity pressure aligns with consumers' desires for immediate satisfaction, which is further amplified by the pleasure of acquiring goods perceived as scarce [29]. Based on the literature review, the following hypotheses were proposed.

H3. Quantity pressure has a significant impact on arousal.

H4. Quantity pressure has a significant impact on pleasure.

2.3. Economic benefit

Economic benefits, particularly those manifested through price pressure such as discounts and flash sales, have a profound influence on consumer excitement and arousal, thereby driving impulsive buying behavior [35]. Research has shown that the prospect of saving money can elicit a strong arousal response in consumers. Chen and Yao [21] found that economically advantageous promotions, which reduce the amount of money consumers need to spend, generate significant pleasure. This sense of savings is particularly potent in stimulating impulsive purchasing tendencies, as sudden and unexpected price changes in digital retail environments amplify stimuli and pleasure. Economic incentives like exclusive discounts and flash sales can surprise and delight consumers, enhancing the overall shopping experience [36]. Xu et al. [29] noticed that the combination of arousal and pleasure, driven by the opportunity for financial savings, strongly motivates impulsive buying. The unexpected nature of these promotions can create a heightened sense of urgency and excitement, compelling consumers to make spontaneous purchasing decisions. Hence, in line with these studies, the following hypotheses were proposed.

H5. Economic benefit has a significant impact on arousal.

H6. Economic benefit has a significant impact on pleasure.

2.4. Social influence

Social influence is a significant driver of impulsive buying behavior, especially within online environments. Consumers are more likely to respond spontaneously to impulse buying stimuli due to the prevalent social influences [37] and the impact of digital influencers [38]. Endorsements from peers and influencers strongly affect purchasing decisions, as social presence and interactive exchanges on online platforms enhance interactivity and prompt impulsive buys [39]. The emotional responses elicited by social influence, such as pleasure and arousal, play a crucial role in driving impulsive purchases [40,41]. Social media endorsements and phenomena like "Buying Fever" illustrate how social cues can significantly impact decision-making processes [42,43]. These social cues create a sense of community and amplify the desire for instant gratification, making consumers more susceptible to impulsive buying. The dynamics of social commerce, such as social media marketing and online reviews, further underscore the importance of social influence [44–46]. Social media platforms provide a space for community-building and interactive exchanges, which can heighten emotional engagement and drive impulsive buying behavior. Positive reviews and endorsements from trusted sources can create a bandwagon effect, where consumers feel compelled to make purchases to align with social trends. Research indicates that social presence on online platforms enhances the overall shopping experience by fostering a sense of connection and engagement. This increased interactivity can lead to heightened arousal and pleasure, thereby increasing the likelihood of impulsive purchases. Hence, in line with these studies, the following hypotheses were proposed.

H7. Social influence has a significant impact on arousal.

H8. Social influence has a significant impact on pleasure.

2.5. Visual

Product presentation videos on platforms like Shopee leverage visual elements to influence impulsive buying behavior, particularly among Generation Z. Effective visual merchandising, including themes, forms, colors, and lighting, can significantly impact consumer impulsive buying behavior [47]. By incorporating these strategies, product presentation can enhance feelings of pleasure and arousal during the shopping experience, highlighting the importance of visual design in the platform's marketing efforts [36,48].

Studies indicate that visuals are critical in triggering impulsive purchases across various contexts [49]. These research shows that visually appealing presentations can elicit strong emotional responses, such as pleasure and arousal, which are key drivers of impulsive buying behavior. The use of vibrant colors, dynamic lighting, and aesthetically pleasing product arrangements can create an immersive shopping experience that captivates consumers and encourages spontaneous purchasing decisions. This suggests that Shopee video platform, which strategically showcases products from multiple perspectives and utilizes engaging visuals, could directly influence consumer preferences and enhance the overall shopping experience on the platform [32]. Similar to visually appealing websites, Shopee's use of visuals to evoke strong emotional responses are more likely to drive impulse purchases among Generation Z consumers [50,51].

Furthermore, the design and aesthetic configuration of the Shopee video platform are crucial in fostering satisfying online interactions and influencing purchase decisions through emotional arousal [52–55]. By effectively utilizing visual elements, Shopee can create a more engaging and immersive shopping environment that appeals to the sensibilities of Generation Z consumers. Based on the literature review, the following hypotheses were proposed.

H9. Visual has a significant impact on arousal.

H10. Visual has a significant impact on pleasure

2.6. Sound

The strategic utilization of sound elements in product presentation videos on the Shopee video platform likely plays a significant role in influencing impulsive buying behavior among Generation Z consumers. Research indicates that background music can shape emotional responses that drive impulsive purchases [56]. By incorporating specific auditory cues, Shopee video platform could create an atmosphere that stimulates emotions conducive to spontaneous buying [57].

Sound also influences pleasure and arousal, which are critical factors in boosting consumer engagement and satisfaction. Joyful, energetic sounds, specific tempos and moods can enhance these emotional states and positively impact consumer behavior [58,59]. For instance, music that evokes pleasure and arousal can foster positive interactions and strengthen brand connections with Generation Z viewers, affecting their perceptions and purchase decisions [60]. Additionally, fast-paced sounds can increase arousal and pleasure, leading to higher engagement with video content [61]. Hence, in line with these studies, the following hypotheses were proposed.

H11. Sound has a significant impact on arousal.

H12. Sound has a significant impact on pleasure.

2.7. Arousal and pleasure

Arousal is defined as an individual's sense of alertness, stimulation, joy, and activity, which varies within different contexts [61,62]. Pleasure, on the other hand, is described as experiencing contentment, happiness, or satisfaction [61]. The Pleasure, Arousal, Dominance (PAD) model highlights the interconnectedness of emotions, indicating that pleasure can be associated with both high arousal (excitement) and low arousal (relief and fulfillment) [63,64].

In retail environments, consumers' sensory arousal directly enhances pleasure [65]. Studies have shown that heightened arousal levels positively influence pleasure across various contexts, demonstrating a dynamic interrelation between these emotional states [66–69]. This relationship is particularly significant in online shopping environments, where visual and auditory stimuli can be carefully crafted to elicit strong emotional responses.

The influence of internal emotions, particularly pleasure and arousal, significantly impact impulsive purchase decisions in online shopping [29]. Emotional responses are crucial in influencing impulse purchases, shaped by the interplay of cognitive and affective states, internal predispositions, and external stimuli [22,65,70]. When consumers experience high levels of arousal and pleasure, they are more likely to make impulsive purchases. Hence, in line with these studies, the following hypotheses were proposed.

H13. Arousal has a significant impact on pleasure.

H14. Arousal has a significant impact on online impulse buying.

H15. Pleasure has a significant impact on online impulse buying.

2.8. Online impulse buying

Online impulse buying is predominantly driven by immediate emotional responses rather than rational thought, with consumers often making purchases based on their spontaneous reactions to products [71]. The design and functionality of online shopping platforms enhance the likelihood of such behaviors [72]. Technological advancements in digital shopping environments streamline the buying process, making impulsive purchases more frequent compared to traditional offline shopping [40,70]. Pereira et al. [71] identify critical indicators of online impulsive buying, including frequent spontaneous purchases, the occasional inability to resist buying urges, and post-purchase guilt. These behaviors are facilitated by the immersive and engaging nature of online shopping platforms, which often utilize sophisticated algorithms to personalize the shopping experience. Personalized recommendations, particularly in short video live e-commerce, exploit customer vulnerabilities by facilitating the discovery of products and prompting impulsive purchases [73]. One-click purchasing options further simplify the purchase journey, increasing conversion rates and the incidence of impulsive purchases [74]. These features reduce the friction in the buying process, allowing consumers to make purchases with minimal effort and time. The convenience and speed of one-click purchases can trigger impulsive decisions, as consumers are less likely to deliberate on their choices and more likely to act on immediate desires.

Fig. 1 presents the theoretical framework and the proposed hypotheses of this research.

3. Methodology

3.1. Research design

This study employed a quantitative approach to examine the factors influencing impulsive buying behaviors among Generation Z consumers on the Shopee video platform. The research comprises two phases: a pilot study and an empirical study. The pilot study, as proposed by Cope [75], serves as an initial evaluation to assess the research's feasibility. It involved 50 survey responses, enabling the refinement of methodological approaches. The empirical phase followed with 438 responses, focusing on structural and model analysis to clarify the relationships between identified factors and impulsive buying behavior. Both phases utilized questionnaires as the primary data collection instrument. This rigorous process enhances the validity and reliability of data by addressing research instrument issues, optimizing data collection methodologies, and ensuring data integrity for regulatory decision-making [76–78].

3.2. Questionnaire and sample

This study employed a structured questionnaire, which was initially developed in English and then translated into Vietnamese using Brislin's back-translation method. To mitigate the potential influence of linguistic and cultural disparities, an expert in English language research and translation was consulted during this process. The questionnaire comprises two main sections. The first section collects demographic information and other relevant data from participants, such as age, gender, and monthly income. It also explores impulse buying behaviors in e-commerce environments, including the frequency of impulsive purchases and average monthly purchase expenditure. The second section of the questionnaire utilized a Likert scale ranging from one (strongly disagree) to five (strongly agree) to assess the impact of various factors on impulse buying. These factors were derived from established theoretical frameworks and previous research, including studies by Kang and Lee [79], Krishna [80], Lin [81], Xu et al. [29].

The questionnaire comprised 9 variables and a total of 37 scale items. Each variable was assessed through a series of items derived from established research in consumer behavior. Specifically, the time pressure variable was assessed through 4 items based on studies by Dhar and Nowlis [82], and Tykocinski and Pittman [83]. Quantity pressure variable was measured by 4 items drawn from research by Dittmar and Beattie [84], and Rook and Fisher [85]. Economic benefits variable was gauged using 5 items sourced from studies by

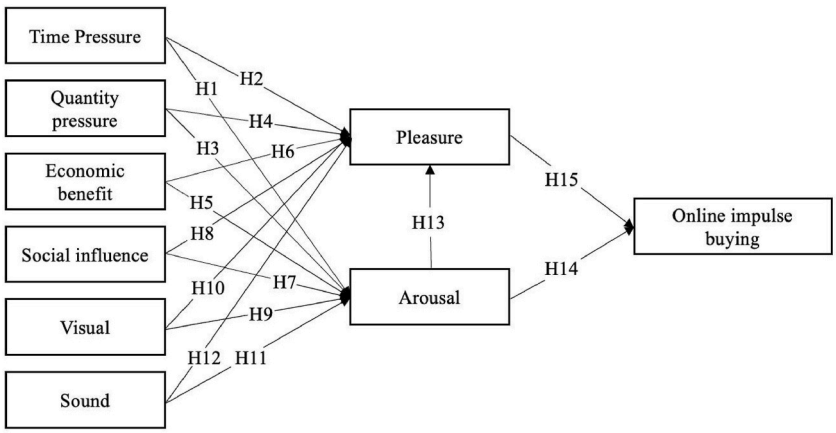

Fig. 1. Theoretical framework.

Aydinli et al. [86], Liu et al. [66], and Zhou et al. [87]. Social influences variable was evaluated through 4 items mapped out using contributions from Ng [88], Shin [89], Wang [90], Kerbache et al. [91], and Lee and Hong [92]. Visual variable was assessed by 4 items informed by the works of Haase and Wiedmann [93], and Liu et al. [66], while the sound variable was measured through 4 items based on Haase and Wiedmann [93]. Arousal and pleasure each were explored with 4 items derived from studies by Hsich et al. [94], Huang et al. [95], and Chang et al. [96]. Lastly, the concept of online impulse buying was examined with 4 items reflecting seminal research by Mehrabian and Russell [62], and Rook and Fisher [85]. This comprehensive approach ensured a thorough investigation into the factors influencing impulse buying behaviors among Generation Z consumers on platforms such as Shopee.

The study explicitly targeted Vietnamese Generation Z individuals who had a history of spontaneous purchases on the Shopee video platform and were born between 1995 and 2006. This age criterion ensured that all participants were appropriately categorized as Generation Z and of legal age, thereby excluding minors from the sample. The sample size was determined using the guideline from Hair et al. [97] for Partial Least Squares Structural Equation Modeling (PLS-SEM), which recommends a minimum sample size of at least 10 times the most extensive set of predictor variables in the model. Consequently, a minimum sample size of 370 was required to ensure statistical robustness, with sensitivity analysis confirming this requirement.

Data from 438 Generation Z respondents were analyzed in the empirical phase, indicating a predominantly youthful and educated sample with monthly incomes ranging from under 5 million VND to less than 10 million VND. This demographic showed significant variability in their frequency and spending on impulsive buying. Detailed demographic characteristics and behaviors are provided in Table 1.

3.3. Data collection and analysis

The data collection for this study employed a dual approach combining online and offline methods to ensure a diverse participant base. Online surveys were distributed through Google Forms, via email, and social networks, including Facebook, Instagram, and Zalo. Concurrently, in-person surveys were conducted in various public spaces such as offices, parks, and university campuses. This methodological diversity aimed to enhance the objectivity and reliability of the collected data. Participant privacy and information security were rigorously maintained through written or verbal consent processes, ensuring voluntary participation without financial inducements and guaranteeing anonymity and confidentiality.

The study employed a non-probability convenience sampling method, noted for its practicality, efficiency, and cost-effectiveness in accessing readily available participants within a specified timeframe [98,99]. The survey, conducted from April 3rd to April 12th, 2024, initially received 636 responses. The study focused on exploring impulsive buying behaviors among Generation Z individuals on the Shopee video platform, specifically targeting those born between 1995 and 2006 who were over 18 years old, ensuring legal capacity for consent and comprehension of survey questions. Exclusion criteria were applied to exclude participants who do not use the Shopee video platform, those who responded too quickly (under 2 min), which may indicate lack of thoughtful consideration, and surveys lacking vital information or completeness [100,101]. The study prioritizes data integrity, disqualifying any responses that aren't objective or truthful, as indicated by Christian et al. [102]. These criteria were designed to maintain data integrity and validity, following established methodologies to enhance the reliability of findings. After applying the exclusion criteria, 438 valid responses were retained, meeting the sample size requirements for robust statistical analysis. This approach ensures that the study can provide a comprehensive exploration of Generation Z's impulsive buying behavior on the Shopee video platform, contributing valuable insights to both academic research and practical applications in e-commerce.

Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0 software,

Table 1
Respondents' demographics and behaviors.

Demographics	Number of Respondents	Percentage
Gender		
Male	162	37 %
Female	270	62 %
Other	6	1 %
Monthly Income		
Under 5 million VND	280	64 %
From 5 - under 10 million VND	103	24 %
From 10 - under 15 million VND	34	8 %
From 15 - under 20 million VND	7	2 %
From 15 - under 20 million VND	7	2 %
Above 20 million VND	14	3 %
Frequency of spontaneous shopping per month		
Less than 3 times	177	40 %
From 3 to 5 times	171	39 %
More than 5 times	90	21 %
Amount spent on spontaneous shopping per month		
Under 500,000 VND	221	51 %
From 500,000 to under 2 million VND	173	40 %
From 2 to under 5 million VND	32	7 %
Above 5 million VND	12	3 %

chosen for its flexibility and suitability for prediction accuracy without stringent demands on sample size or data distribution [103]. The analysis assessed the quality and reliability of the dataset using several metrics: indicator reliability, Cronbach's alpha, composite reliability, convergent validity, and discriminant validity. Impact relationships between latent variables were evaluated through latent variable correlations using bootstrap analysis, examining the correlation coefficient of the original sample and the statistical significance through p-values. This rigorous approach allowed for a comprehensive evaluation of the proposed hypotheses.

Table 2
Measurement model assessment.

Constructs' Items	Outer loadings	CA	CR	AVE
Time pressure [82,83]		0.825	0.884	0.655
TP1: "I think that the indicated time limit is very tight, and I probably won't be able to buy it."	0.838			
TP2: "When making buying decisions the indicated time limit makes me feel sick."	0.796			
TP3: "I feel that I do not have enough time for proper consideration."	0.798			
TP4: "I think that if I don't buy it immediately, I will regret it later."	0.804			
Quantity pressure [84,85]		0.900	0.930	0.769
QP1: "I think that if I don't rush to buy the product it will be sold out soon."	0.861			
QP2: "I think that the amount of available products will not be able to satisfy demand."	0.889			
QP3: "I feel that I must make a decision before the products are sold out."	0.889			
QP4: "I am worried about the number of products that are limited on the Shopee video platform."	0.870			
Economic benefits [66,86,87]		0.776	0.848	0.528
EB1: "This promotion has a huge impact on my purchasing plan and the discount is very attractive."	0.774			
EB2: "If I give up this chance, I will feel a self-inflicted loss."	0.677			
EB3: "Faced with discounted products I always want to buy without much thought."	0.668			
EB4: "I can get products at an affordable price on Shopee video."	0.735			
EB5: "Shopee video allows me to save money spent on buying products."	0.773			
Social influence [88–92]		0.876	0.915	0.73
SI1: "I find it useful to read online reviews."	0.821			
SI2: "If I find that many of my acquaintances purchase from a store on Shopee video, then I would be more willing also to make a purchase in that store."	0.888			
SI3: "My decision to purchase from a store in Shopee video because my friends do so, and I want to belong to them."	0.880			
SI4: "I choose to consider and accept product recommendations from others without any hesitation when deciding to purchase on Shopee video."	0.826			
Visual [66,93]		0.883	0.919	0.74
VS1: "The content shown on Shopee video is aesthetic, attractive, visually appealing and a visual treat."	0.853			
VS2: "I find the way Shopee video displays the product information is attractive."	0.853			
VS3: "I find the overall look and feel of Shopee video is visually appealing."	0.862			
VS4: "I like the visual appearances of Shopee video."	0.872			
Sound [93]		0.929	0.949	0.824
SO1: "The background sound used in store's videos on Shopee video is euphonic."	0.885			
SO2: "The background sound used in the store's videos on Shopee video is good."	0.921			
SO3: "The background sound used in store's videos on Shopee video is melodic."	0.911			
SO4: "The background sound used in store's videos on Shopee video is pleasant."	0.914			
Arousal [94–96]		0.928	0.949	0.823
AR1: "When I was shopping on Shopee video, I felt excited."	0.924			
AR2: "When I was shopping on Shopee video, I felt active."	0.902			
AR3: "When I was shopping on Shopee video, I felt aroused."	0.905			
AR4: "When I was shopping on Shopee video, I felt stimulated."	0.898			
Pleasure [94–96]		0.915	0.94	0.798
PL1: "When I was shopping on Shopee video, I felt happy."	0.879			
PL2: "When I was shopping on Shopee video, I felt pleased."	0.914			
PL3: "When I was shopping on Shopee video, I felt satisfied."	0.880			
PL4: "When I was shopping on Shopee video, I felt hopeful."	0.899			
Online Impulse Buying [62,85]		0.905	0.933	0.778
OIB1: "I usually buy products on Shopee video spontaneously."	0.895			
OIB2: "The products I bought on Shopee video are mostly unplanned."	0.902			
OIB3: "I bought a product on Shopee video that I did not initially want to buy."	0.865			
OIB4: "I sometimes cannot suppress the feeling of wanting to buy something online."	0.865			

4. Results

This section presents the results of our investigation into the measurement model employed in this study. The study begins by examining convergent validity and reliability, fundamental aspects underpinning the measurement model's integrity. Subsequently, discriminant validity will be assessed to ascertain the distinctiveness of the constructs under scrutiny. Then, the structural model results will be delved into, and collinearity statistics and hypotheses will be evaluated to provide insights into the relationships between variables. Finally, assess the explanatory and predictive power of the research model, shedding light on its ability to explain and forecast outcomes.

4.1. Measurement model results

4.1.1. Convergent validity and reliability of constructs

Convergent validity and the reliability of constructs are fundamental aspects evaluated in this study to ensure the integrity of the measurement model. The assessment of convergent validity aims to ascertain the degree of association between theoretically related constructs. On the other hand, reliability measures the internal consistency or reliability of the scale or test items. The outcomes of these assessments are detailed in Table 2.

The study commenced with an evaluation of the measurement model's adequacy by initially examining the outer loading index, which assesses the strength of associations between observed variables and their respective latent constructs. According to Hair et al. [104], an outer loading coefficient above 0.7 indicates satisfactory quality. The results presented in Table 2 show that most observed variables exhibited outer loading coefficients ranging from 0.735 to 0.924, surpassing the recommended threshold. However, two coefficients, EB2 and EB3, fall slightly below 0.7 (0.677 and 0.668, respectively). While considering the potential removal of indicator variables with outer loadings between 0.4 and 0.7, researchers should cautiously evaluate their impact on internal consistency reliability and convergent validity enhancements. Nevertheless, these values might still be deemed acceptable when accounting for additional indices such as composite reliability (CR) and convergent validity, consistent with insights from prior research [105]. Furthermore, Hulland [106] suggests that an outer loading index exceeding 0.5 remains acceptable, reinforcing the robustness of the measurement model despite minor deviations in specific coefficients. Therefore, items EB2 and EB3 were retained for further analysis.

The reliability of the constructs is assessed through Cronbach's Alpha and Composite Reliability indices. Both indices should be greater than or equal to 0.7 to ensure reliability [104,107,108]. Results from Table 2 show that all Cronbach's Alpha and Composite Reliability indices exceed 0.7, confirming the reliability of the variables under study. Convergent validity is further evaluated using the Average Variance Extracted (AVE), which indicates the degree of correlation between a variable and its items. Hock and Ringle [109] suggest that an AVE of 0.5 or higher indicates sufficient convergent validity. As can be seen in Table 2, the AVE values for all variables exceed 0.5, ranging from 0.528 to 0.824, thus confirming valid convergent validity.

Overall, these results provide compelling evidence of the validity and reliability of the measurement model employed in this study, bolstering confidence in the integrity of the measures utilized.

4.1.2. Discriminant validity of constructs

Discriminant validity is a crucial aspect of research to determine whether a construct is truly distinct from other constructs within the model. Two commonly employed methods for discriminant validity are the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio of Correlations (HTMT) [110]. According to Fornell and Larcker [111], discriminant validity is established when the Average Variance Extracted (AVE) square root for each latent variable exceeds the correlations between that variable and any other latent variable. The results presented in Table 3 reveal that the square roots of the AVEs surpass the correlations among the corresponding constructs. This finding confirms the presence of discriminant validity, indicating that the analyzed constructs are adequately distinct based on the Fornell-Larcker criterion [112]. This indicates that the integrity and distinctiveness of the conceptual model are supported by the confirmation of discriminant validity, underscoring the robustness of the study's theoretical framework.

Another approach to assess discriminant validity is through the HTMT. According to Garson [113], discriminant validity between two latent variables is ensured when the HTMT value is below 1. As shown in Table 4, all HTMT values in this study satisfy this criterion, indicating adequate discriminant validity among the constructs. Overall, both the Fornell-Larcker criterion and the HTMT index confirm the discriminant validity of the constructs. These findings affirm that none of the variables violate the principles of

Table 3
Fornell and Larcker table.

	AR	EB	OIB	PL	QP	SI	SO	TP	VS
AR	0.907								
EB	0.546	0.727							
OIB	0.758	0.446	0.882						
PL	0.850	0.503	0.704	0.893					
QP	0.661	0.558	0.597	0.637	0.877				
SI	0.712	0.607	0.621	0.704	0.696	0.854			
SO	0.684	0.473	0.621	0.665	0.561	0.672	0.908		
TP	0.454	0.301	0.425	0.451	0.601	0.411	0.348	0.809	
VS	0.594	0.472	0.512	0.522	0.580	0.663	0.544	0.306	0.860

Table 4
Heterotrait-monotrait ratio (HTMT).

	AR	EB	OIB	PL	QP	SI	SO	TP	VS
AR									
EB	0.643								
OIB	0.826	0.532							
PL	0.921	0.590	0.772						
QP	0.722	0.668	0.660	0.702					
SI	0.789	0.735	0.696	0.787	0.784				
SO	0.737	0.557	0.678	0.721	0.612	0.745			
TP	0.515	0.374	0.487	0.517	0.697	0.480	0.396		
VS	0.654	0.565	0.572	0.579	0.649	0.753	0.599	0.354	

discriminant validity, ensuring the integrity and distinctiveness of the research constructs.

4.2. Structural model results

4.2.1. Collinearity statistics (inner VIF)

The data collection method employed in this study involved gathering predictor and outcome data through a self-response survey. While this approach offers convenience, it also introduces the potential for common method bias (CMB). Common method bias occurs when respondents provide similar answers to questions due to overlapping content in the survey or the tendency to answer in socially desirable ways. Consequently, distinct constructs may appear more correlated than they are, potentially inflating correlations among variables and reflecting shared data collection methods rather than genuine relationships between the variables.

To address this concern, collinearity statistics, specifically the Variance Inflation Factor (VIF), were utilized to evaluate multicollinearity between independent latent variables. Multicollinearity significantly threatens the model's integrity by inflating standard errors and distorting parameter estimates. According to Hair et al. [114], a VIF score greater than 5 indicates a high likelihood of multicollinearity. However, the results presented in Table 5 show that all VIF values are below 5, indicating the absence of multicollinearity issues among the latent variables. These results reveal that multicollinearity between the independent latent variables has been effectively mitigated, ensuring the validity and reliability of the model.

4.2.2. Hypotheses assessments (path coefficients)

Table 5 presents the results of the hypotheses testing. Firstly, it was found that time pressure (TP) positively influences arousal (AR) (H1: O = 0.099; p = 0.020), thus supporting H1. Conversely, time pressure (TP) has a statistically insignificant impact on pleasure (PL) (H2: O = 0.043; p = 0.204), leading to the rejection of H2. This suggests that while time pressure increases arousal, it diminishes consumers' positive emotions. Similarly, quantity pressure (QP) positively affects arousal (AR) (H3: O = 0.154; p = 0.007), supporting H3. However, quantity pressure (QP) has a statistically insignificant impact on pleasure (PL) (H4: O = 0.052; p = 0.285), rejecting H4. These findings indicate that while consumers may feel arouse under quantity pressure, their pleasure emotions tend to decrease in response to this pressure. The results indicate that economic benefits (EB) positively influence arousal (AR) (H5: O = 0.095; p = 0.013), supporting H5, but have a statistically insignificant effect on pleasure (PL) (H6: O = −0.015; p = 0.744), rejecting H6. This suggests that while economic benefits excite customers, it does not necessarily contribute to their satisfaction, possibly due to concerns about product quality at lower prices. Social influence (SI) positively affects both arousal (AR) and pleasure (PL) significantly (H7: O = 0.227, p = 0.000; H8: O = 0.173, p = 0.000), supporting H7 and H8. These results suggest that as the level of social influence increases, so do the feelings of arousal and pleasure among consumers. Additionally, visual (VS) positively impacts arousal (AR) (H9: O = 0.114; p =

Table 5
Summary of structural model.

H	Structural	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	VIF	Results
H1	TP → AR	0.099	0.043	2.307	0.020	1.58	Accepted
H2	TP → PL	0.043	0.034	1.248	0.204	1.606	Rejected
H3	QP → AR	0.154	0.057	2.720	0.007	2.809	Accepted
H4	QP → PL	0.052	0.050	1.043	0.285	2.875	Rejected
H5	EB → AR	0.095	0.039	2.473	0.013	1.696	Accepted
H6	EB → PL	−0.015	0.048	0.323	0.744	1.721	Rejected
H7	SI → AR	0.227	0.058	3.922	0.000	3.057	Accepted
H8	SI → PL	0.173	0.050	3.487	0.000	3.199	Accepted
H9	VS → AR	0.114	0.042	2.723	0.007	1.931	Accepted
H10	VS → PL	−0.074	0.034	2.196	0.035	1.967	Accepted
H11	SO → AR	0.304	0.060	5.109	0.000	1.933	Accepted
H12	SO → PL	0.105	0.045	2.348	0.019	2.187	Accepted
H13	AR → PL	0.653	0.050	13.144	0.000	2.748	Accepted
H14	AR → OIB	0.576	0.071	8.056	0.000	3.597	Accepted
H15	PL → OIB	0.215	0.077	2.783	0.005	3.597	Accepted

0.007), supporting H9, but negatively affects PL (H10: O = −0.074; p = 0.035), supporting H10. This indicates that while visuals increase arousal, they may also affect pleasure negatively. Sound (SO) positively impacts both arousal (AR) and pleasure (PL) (H11: O = 0.304; p = 0.000; H12: O = 0.105; p = 0.019), supporting H11 and H12. The results indicate that the positive effects of sound consistently enhance feelings of arousal and pleasure. Moreover, arousal (AR) positively affects both pleasure (PL) and impulsive buying behavior (OIB) (H13: O = 0.653; p = 0.000; H14: O = 0.576; p = 0.000), supporting H13 and H14. These results show that as arousal increases, consumers' pleasure and their impulsive buying behavior also increase. Notably, H13, with the highest O value of 0.653, indicates that arousal has the most significant impact on pleasure. Finally, pleasure (PL) positively affects impulsive buying behavior (OIB) (H15: O = 0.215; p = 0.005), supporting H15. The results suggest that as consumers' perceived pleasure increases, their tendency to make impulsive purchases also rises. Fig. 2 presents the results of PLS-SEM modeling analysis.

4.2.3. *Evaluation of explanatory power (R square) and predictive power (Q square) of the research model*

The study utilized R-squared and Q-squared indices to assess the explanatory and predictive capabilities of the model. The R-squared index measures the proportion of variance in the dependent variable explained by the independent variables. On the other

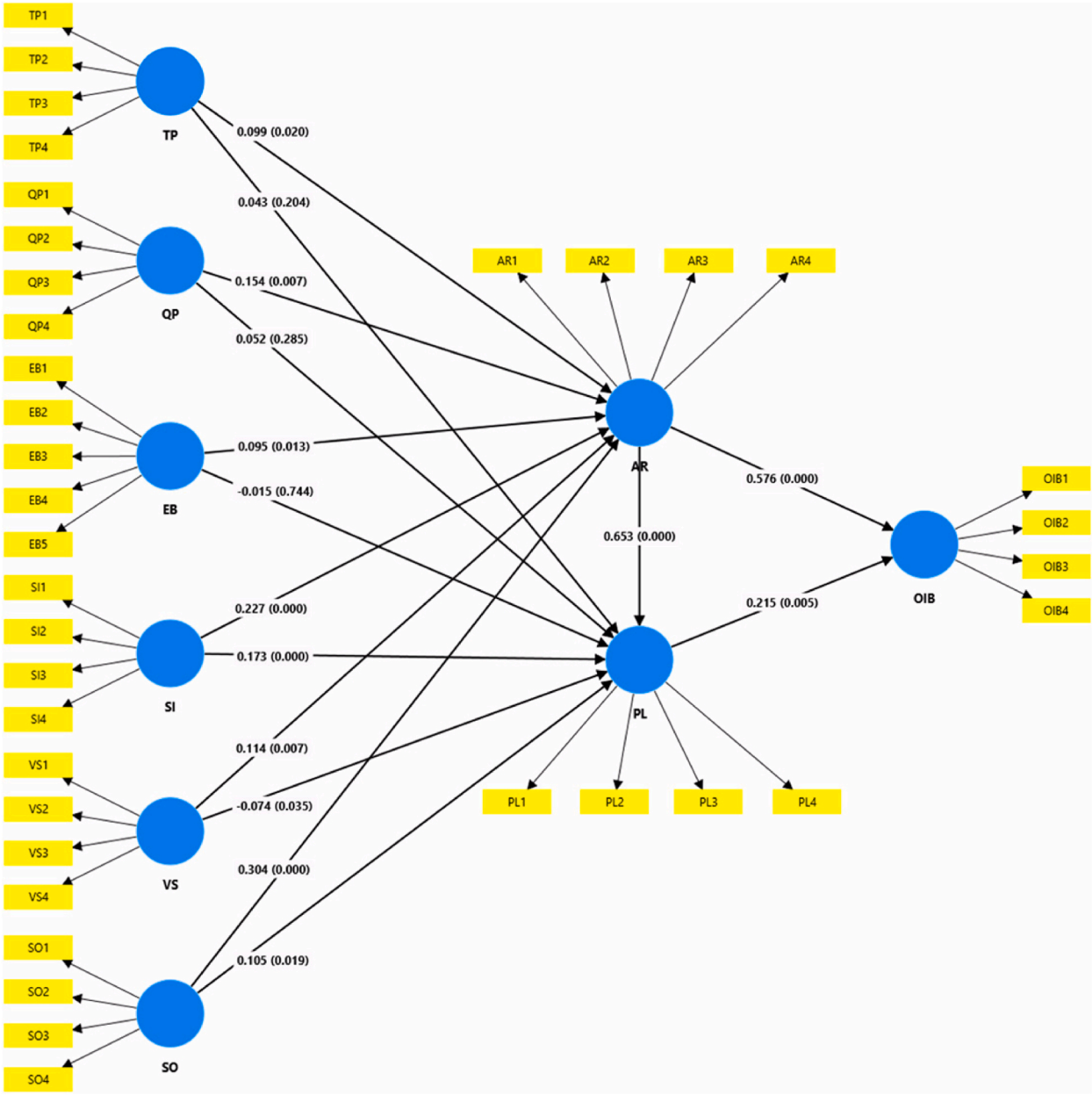

Fig. 2. PLS-SEM inner & outer model.

hand, Q-squared is used for evaluating out-of-sample prediction ability, reflecting the model's predictive capability [115]. In this study, the adjusted R-squared was prioritized due to its ability to account for the number of predictors, providing a more accurate estimation of explanatory power.

According to the results presented in Table 6, the highest adjusted R-squared value was observed for Pleasure (PL) at 0.749, indicating that the independent variables explain 74.9 % of the variance in PL. The adjusted R-squared for Arousal (AR) was the second highest at 0.631, explaining 63.1 % of AR's variance. Impulsive Buying Behavior (OIB) had the lowest adjusted R-squared at 0.586, suggesting that the independent variables account for 58.6 % of its variance. According to Hair et al. [114], the R-squared value illustrates the explanatory power of the independent variables on a dependent variable. However, more than R-squared alone is needed to fully capture the model's predictive ability, as it relies on characteristics not included in the study sample. To address this, Stone [116] and Geisser [117] introduced the Q-squared index to evaluate out-of-sample predictive power. The Q-squared for OIB is 0.452, falling within the 0.25–0.5 range, indicating average predictive accuracy. Meanwhile, the Q-squared values for PL and AR are 0.594 and 0.517, respectively, suggesting high predictive accuracy for these models. This makes Q-squared an essential metric for assessing the model's predictive capabilities.

The results presented in this section offer comprehensive insights into the validity, reliability, and predictive capabilities of the measurement and structural models utilized in this study. Our analysis confirms the integrity of the measurement model, supported by robust convergent and discriminant validity assessments. Furthermore, the structural model results elucidate the relationships between key variables, revealing intriguing patterns of influence. Notably, our evaluation of explanatory and predictive power underscores the model's effectiveness in explaining variance and forecasting outcomes.

5. Discussion

This study investigates the factors influencing online impulsive buying behavior, particularly among Generation Z consumers on the Shopee video platform. This focused on exploring the impacts of external stimuli including time pressure (TP), quantity pressure (QP), economic benefits (EB), social influence (SI), visual (VS), and sound (SO) on online impulsive buying (OIB), mediated by emotional responses, namely arousal (AR) and pleasure (PL).

5.1. Impacts of time pressure on emotional states

The study shows that time pressure (TP) significantly enhances arousal (AR) during the purchasing process, supporting H1 ($O = 0.099$; $p = 0.020$), which leads to more impulsive purchases. This finding aligns with prior research, which also suggests that the urgency created by limited-time offers heightens consumer arousal [118–120]. This heightened arousal stems from the fear of missing out on similar deals in the future, prompting immediate purchasing decisions to avoid regret. Conversely, the impact of time pressure (TP) on pleasure (PL) is found to be statistically insignificant, rejecting H2 ($O = 0.043$; $p = 0.204$). This contrasts with findings by Xu et al. [29] and DeVoe and Pfeffer [121], who observed that high TP can induce anxiety and doubt, thereby reducing the pleasure of shopping. This discrepancy might be attributed to the distinctive traits of Generation Z consumers, who tend to exhibit partial passivity, frequently change their opinions, and place significant value on authenticity and transparency, focusing only on products they genuinely love [122]. They are well-informed consumers who typically conduct thorough research before making purchases, reducing their susceptibility to pressure. Although time pressure can enhance arousal and promote impulsive buying, it may detract from the overall pleasure of the shopping experience. On platforms like Shopee, the heightened arousal from time pressure aligns with Generation Z's preference for quick gratification, making it effective for stimulating impulsive purchases. However, if the shopping experience feels overly rushed, it may have a statistically insignificant impact on their feelings of pleasure.

5.2. Impacts of quantity pressure on emotional states

The study indicates that quantity pressure (QP) significantly increases arousal (AR), supporting H3 ($O = 0.154$; $p = 0.007$). This finding aligns with Lamis et al. [123] and Guo et al. [124], who both demonstrated that product scarcity enhances arousal, drives purchasing behaviors, sparks consumer interest, and prompts swift acquisition actions. However, the study suggests that the impact of quantity pressure (QP) on pleasure (PL) is statistically insignificant, rejecting H4 ($O = 0.052$; $p = 0.285$). This implies that while scarcity may increase arousal, it may not necessarily enhance the consumer's emotional well-being. This finding contrasts with research by Kristofferson et al. [125] and Xu et al. [29], which posits that scarcity and increased quantity pressure lead to perceived competitive threats, stress, and decreased shopping pleasure. The difference in findings is attributed to Generation Z's skepticism and demand for authenticity, making them less responsive to such pressures [122,126]. Additionally, as digital natives adept at processing information quickly [127], Generation Z can efficiently analyze product value, mitigating concerns over quantity pressure.

Table 6
P-squared and Q-squared values.

	R Squared	R Squared Adjusted	Q Squared
AR	0.636	0.631	0.517
OIB	0.588	0.586	0.452
PL	0.753	0.749	0.594

5.3. Impacts of economic benefits on emotional states

The study finds that economic benefits (EB) increase arousal (AR), confirming H5 (O = 0.095; p = 0.013). This finding aligns with research indicating that discounts and acquiring products at prices lower than expected arouse purchasing behaviors [128–130]. The growing trend of "loud budgeting" among Generation Z supports the finding, particularly as entering 2024. This period marks the return of student loan payments, high credit card debt, and rising inflation, heightening economic sensitivity among this demographic [131]. As a result, economic benefits are likely to stimulate this user group further, making them more responsive to financial incentives and cost-saving opportunities. However, the impact of economic benefits on pleasure (PL) is statistically insignificant, rejecting H6 (O = −0.015; p = 0.744), which highlights variability in how EB influences emotional pleasure. This contrasts with studies by Bhattacharya and Anand [132] and Lamis et al. [123], which reported significant enhancements in pleasure from economic benefits. Cultural and economic contexts in Indonesia, India, and Vietnam also significantly influence consumer behavior and the perceived value of financial transactions, leading to different findings. Personal cultural values impact purchasing behavior, making consumers more hesitant to engage in e-commerce transactions [133]. These cultural differences substantially influence how consumers perceive the value of economic benefits in their purchase intentions [134]. Moreover, Generation Z's instinctive skepticism leads them to be wary of sudden benefits, resulting in varied reactions to economic incentives [122].

5.4. Impacts of social influence on emotional states

This study substantiates that social influence (SI) significantly heightens arousal (AR), supporting H7 (O = 0.227, p = 0.000). The findings demonstrate that as social impact increases, so does emotional arousal. This aligns with the observations of Arnold and Reynolds [135], who observed that shopping with friends and family elevates arousal. The effect of social influence is also evident from the extensive sharing of purchase experiences online, which profoundly affects consumer behavior [136,137]. This social engagement not only fosters purchasing desires but also encourages mimicking within peer groups. Social influence also positively impacts pleasure levels (PL), confirming H8 (O = 0.173, p = 0.000), which indicates that increased social influence corresponds with increased pleasure. This is seen when consumers receive social support for their consumption behaviors; such support acts as a form of validation that enhances their enjoyment of spending, according to recent findings by Kim and Baker [138]. The findings illustrate that social contexts and interactions play a critical role in shaping consumer emotions and behaviors.

5.5. Impacts of visual on emotional states

The study validates that visual effects significantly boost arousal, confirming H9 (O = 0.114; p = 0.007), indicating that visual aesthetics impact consumers' perception of stimulation. This finding is supported by Goel et al. [139] and Liu and Zhang [53], who highlight the influence of appealing visuals and suggest that visual attractiveness enhances arousal levels. Furthermore, there is an inverse impact between visual effects and pleasure, supporting H10 (O = −0.074; p = 0.035). This result is consistent with research showing that positive effects can broaden the scope of visual attention [140]. These findings align with the broaden-and-build theory of positive emotions [141]. This theory proposes that positive emotions like joy, interest, satisfaction, excitement, or love, experienced before the presentation of visual stimuli [142], temporarily expand an individual's thought-action repertoire, thereby enhancing their attention to visual elements.

5.6. Impacts of sound on emotional states

The study shows that sound (SO) enhances arousal (AR) and pleasure (PL), supporting H11 (O = 0.304; p = 0.000), and H12 (O = 0.105; p = 0.019), respectively. Research by Meng et al. [58] and Goel et al. [139] indicates that joyful and appealing sounds significantly increase pleasure and arousal, underscoring the importance of sound quality and its alignment with consumer expectations. Similar studies show that the quality and characteristics of sound influence arousal and pleasure, thereby impacting consumer perceptions and engagement, which is crucial in marketing and retail environments.

5.7. Impacts of arousal on pleasure

The study posits a significant relationship between arousal (AR) and pleasure (PL), confirming H13 (O = 0.653; p = 0.000), which suggests that arousal directly influences feelings of pleasure, particularly in impulsive buying on online platforms. This finding aligns with research by Liu et al. [66], Huang [143], and Loureiro [144], who found that arousal and pleasure are closely connected, with arousal potentially enhancing pleasure and leading to increased consumer satisfaction. These insights indicate that in online shopping environments, initial arousal can trigger positive emotions, ultimately increasing pleasure. This relationship is crucial for designing online shopping experiences, suggesting that strategically using elements that stimulate arousal can significantly enhance consumer pleasure.

5.8. Impacts of emotional states on online impulse buying

The study found that arousal (AR) and pleasure (PL) significantly drive online impulsive buying behaviors, supporting H14 (O = 0.576; p = 0.000) and H15 (O = 0.215; p = 0.005). This effect was observed within the context of various influencing factors, including

time pressure (TP), quantity pressure (QP), economic benefits (EB), social influence (SI), visual stimuli (VS), and sound (SO). These findings align with prior research, such as Lin and Lo et al. [145], which identified a strong positive link between arousal, pleasure, and online impulsive shopping behavior. These emotional states attract consumers to online platforms, where arousal can trigger online impulsive buying actions [146]. This often results from a lack of self-control [147], with mood directly influencing immediate emotional gratification [148]. Those experiencing pleasure are more likely to spend freely without extensive deliberation [149]. These hypotheses support the argument that impulsive purchasing is primarily driven by emotional reactions, particularly arousal and pleasure [74,150].

These findings are crucial for e-commerce strategies, especially regarding product videos that profoundly influence consumer behavior and integrate sensory stimuli to evoke arousal and pleasure. Unlike models centered on external incentives like promotions [151], website quality, or regulations [152], this study focuses on manipulating internal states, including arousal and pleasure, to enhance online impulsive buying. A range of pleasure emotions can be triggered by effectively managing arousal, thus significantly boosting buying decisions. Particularly, Generation Z, digital natives accustomed to interactive and dynamic content, are highly susceptible to making impulsive purchases when their emotional states are intensely stimulated. This insight underscores how arousal and pleasure can be strategically cultivated through online interactions, highlighting Generation Z's particular responsiveness to these emotional triggers and their tendency towards online impulsive buying.

6. Conclusion

The main objective of this study is to investigate the factors influencing online impulsive buying behavior among Generation Z consumers on the Shopee video platform. The study employed the PLS-SEM statistical technique to assess the model to identify how external factors such as time pressure (TP), quantity pressure (QP), economic benefits (EB), social influence (SI), visual (VS), and sound (SO) influence online impulsive buying through emotional responses.

The results revealed a significant positive impact of time pressure and quantity pressure on arousal, although their effect on pleasure was not significant. This suggests a complex relationship between these emotions during the shopping process. Scarcity tactics, such as limited edition discounts and lightning deals, effectively stimulate consumer arousal, promoting quick purchasing decisions. Economic benefits also increased arousal, but their influence on pleasure was statistically insignificant, highlighting variability in how financial incentives affect consumers. Strategies like flash sales during peak hours and exclusive discounts enhance arousal, making impulsive purchases more likely. Social influence and sound were found to positively impact both arousal and pleasure, demonstrating the intricate interaction between these emotional responses in driving online impulsive buying behavior. Positive reviews from friends, colleagues, and social media influencers significantly contribute to consumer pleasure and arousal, emphasizing the role of social proof in impulsive buying. Visual stimuli were also shown to enhance both arousal and pleasure, underscoring their subtle yet profound effects on consumer emotions. In the digital age, marketers employ eye-catching visual strategies through unique and creative product displays that attract consumers and increase the pleasure and arousal associated with the buying process. This highlights the importance of visual design in influencing consumer behavior. Joyful and energetic sounds, along with musical characteristics such as tempo and mood, significantly heighten consumer pleasure and arousal, fostering a favorable buying atmosphere. This, in turn, boosts the propensity for online impulsive buying. Conversely, sad sounds negatively impact consumers' psychology, leading to melancholy and potentially decreasing their willingness to engage in shopping. Notably, sound significantly enhances arousal more than any other factor, while social influence has the most substantial effect on pleasure. Moreover, both arousal and pleasure were found to significantly impact online impulsive buying behavior, with arousal exerting a greater influence than pleasure. This underscores the critical role of emotional responses in driving impulsive purchasing decisions on online platforms. These findings provide valuable insights for marketers aiming to design effective strategies to stimulate online impulsive buying among Generation Z consumers.

These insights suggest marketers leverage social dynamics and practical sound design to heighten emotional responses and encourage online impulsive buying on digital platforms. Additionally, the study emphasizes the need for a strategic balance of stimuli to optimize excitement and satisfaction among Generation Z shoppers, fostering engaging and impulsive online shopping experiences on platforms like Shopee. This research provides critical contributions to understanding the dynamics of online consumer behavior, offering actionable strategies for e-commerce platforms targeting online impulsive buying tendencies.

6.1. Theoretical implications

Existing literature has primarily examined the impact of product presentation videos on product sales and purchase intention [16,19], focusing predominantly on the urge of online impulsive buying while overlooking the emotional responses elicited by these videos [22,23]. This study addresses this gap by exploring the intricate relationship between external factors (such as time pressure, quantity pressure, economic benefits, social influence, visual elements, and sound elements) and the generation of arousal and pleasure as emotional responses.

By introducing emotional response as a mediator, this research extends our comprehension of online impulsive buying behavior in digital contexts. A previous study by Xu et al. [29] has emphasized the significance of arousal and pleasure in online impulsive buying, and this study further develops this understanding by investigating how external stimuli on social media platforms contribute to these emotional responses, thereby influencing impulsive purchase decisions.

The study validates the Pleasure-Arousal-Dominance (PAD) theoretical model [143], which categorizes human reactions to stimuli into feelings of pleasure and arousal. Additionally, it supports the scarcity theory of Bruijn [153], defining scarcity as a condition

where resources fall short of perceived necessity, significantly impacting decision-making processes. In the context of online impulse buying, scarcity, whether of time or quantity, limits consumer freedom to postpone purchases, thereby enhancing arousal and prompting immediate purchasing actions to prevent missed opportunities.

Moreover, the broaden-and-build theory of positive emotions [154] is corroborated, highlighting how positive stimuli, such as appealing visuals and social encouragement, expand cognitive boundaries and foster positive emotional experiences. These influences lead to heightened pleasure and arousal, driving online impulsive buying behaviors in online settings where visual and social cues are prominently displayed.

Furthermore, the theory of psychological reactance [155] is validated, suggesting that perceived threats to freedom of choice trigger motivational arousal aimed at regaining lost liberties. This explains impulse purchases under conditions of scarcity, as consumers swiftly act to reclaim their freedom to choose.

6.2. Managerial implications

This research offers essential insights for marketers examining how online stimuli affect the online impulsive buying behaviors of Generation Z consumers on the Shopee video platform. It develops a framework identifying key factors driving impulsive online purchases, which is vital for retailers, marketers, and platform providers aiming to boost e-commerce sales [156]. Marketers should first thoroughly understand customer needs related to Time Pressure (TP), Quantity Pressure (QP), and Economic Benefits (EB) to devise effective marketing strategies that stimulate online impulsive buying. Additionally, crafting content that resonates with Generation Z and employing image strategies to shape consumer preferences can enhance the online impulsive buying experience. Furthermore, creating marketing campaigns that evoke emotional responses through compelling visual and auditory storytelling is crucial.

Specifically, the study underscores the potency of limited-time offers and scarcity tactics in elevating consumer arousal and facilitating online impulsive buying behavior. Managers are advised to utilize time and quantity constraints through flash promotions and limited product availability announcements to create urgency. However, it is crucial to maintain a balance to prevent overwhelming consumers, which can diminish satisfaction and deter purchases. Discounts and economic incentives are shown to increase arousal but have varying impacts on pleasure. Customizing discounts for market segments that prioritize economic benefits can drive impulsive purchases. Moreover, understanding cultural and economic contexts is essential for aligning incentives with local consumer values and expectations, especially in diverse markets. As the role of social interactions in boosting both arousal and pleasure is emphasized, e-commerce platforms should promote social sharing and reviews, integrate social shopping features, and engage in influencer partnerships to foster community and authenticity, thereby enhancing impulse buying. Optimizing visual and auditory elements is also critical. Investments in high-quality product images and engaging video content are necessary to meet consumer expectations and improve the shopping experience, ultimately encouraging online impulsive buying. The direct relationship between arousal and pleasure suggests that designing online shopping experiences that leverage arousal to induce positive emotional states can significantly enhance consumer satisfaction and promote impulsive purchases.

In summary, this study identifies the stimuli influencing Generation Z, particularly their responsiveness to dynamic and sensory-rich content on Shopee video, providing marketers with effective strategies to tap into this behavior and drive online impulsive buying.

6.3. Limitation and recommendation

This study acknowledges limitations that affect the interpretation of its results. The sample consisted of 438 participants primarily representing Generation Z. The sampling method is primarily to an online platform. These limit the generalizability of the findings across the entire Generation Z population in Vietnam. Future research should include a larger sample, capturing both online and offline samples, to provide a more comprehensive view of Generation Z's online buying behavior.

Additionally, the research could be enhanced by developing a comparative model to analyze the characteristics and behaviors across different demographic groups. Incorporating multiple generations would provide deeper insights into the factors influencing online impulsive buying across age groups.

Future research should aim to increase the sample size and expand the demographic and geographical scope of the study. Integrating qualitative research methods such as in-depth interviews or focus groups could uncover underlying motivations and emotions that surveys might not capture, offering a fuller picture of online impulse buying behavior. These steps will improve the reliability of the research and provide a stronger foundation for marketers to engage effectively with consumers.

Ethics declarations

All participants gave their informed consent to take part in the study. The questionnaires were anonymized, and respondents could withdraw from the study whenever if they felt uncomfortable. The study procedure received ethical approval from FPT Can Tho University, Vietnam (Approval No. 20240402.01).

Data availability statement

Due to concerns over intellectual property, the data cannot be publicly disclosed but will be provided upon request.

CRediT authorship contribution statement

Thi Thuy An Ngo: Writing – review & editing, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Hoang Lan Thanh Nguyen:** Writing – original draft, Visualization, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Hoang Phi Nguyen:** Writing – original draft, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Ho Truc Anh Mai:** Writing – original draft, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Thi Huyen Tran Mai:** Writing – original draft, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Phuoc Long Hoang:** Writing – original draft, Resources, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e35743.

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