Revisiting perceived gratification, consumer attitudes and purchase impulses in cross-border e-commerce live streaming: a direct and indirect effects model

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Abstract
Purpose – Cross-border e-commerce live streaming morphs into an epidemic shopping scenario, yet there is a paucity of research on impulse purchasing in this context. The purpose of this study is to empirically investigate the adoption motivation of cross-border e-commerce live streaming and its influence mechanism on intrinsic response and purchase impulse and to highlight the mediating role of browsing behavior.

Design/methodology/approach – Based on the use and gratification lens, a new conceptualization model is established to captivate the theoretical relationships between perceived stimuli, individual attitudes, browsing behavior and impulsive purchases. A questionnaire survey was used to collect cross-sectional data from 427 Malaysian consumers and the estimated framework was validated through AMOS-structural equation modeling technique.

Findings – The findings confirm that perceived interactivity, perceived information usefulness and perceived enjoyment significantly influenced positive attitudes toward live-streaming, which in turn induced impulsive purchases; however, perceived affective gratification did not stimulate positive attitudes. Consumers’ utilitarian browsing had a stronger effect on impulse purchases than hedonic browsing and utilitarian browsing behavior mediated the relationship between positive attitudes and impulse buying; however, hedonic browsing had neither a direct nor a mediating effect on impulsive purchases.

Practical implications – This research enhances the literature on the impact of cross-border e-commerce live streaming, an emerging technology, on consumer behavior and offers managerial implications for e-commerce practitioners to gain insights into consumer impulse purchasing behavior.

Originality/value – The findings revamp conventional knowledge and provide new angles for understanding the formation mechanisms of impulse purchases, motivations for virtual media use and browsing behavior mediating effects in the context of live streaming.

Keywords Cross-border e-commerce, Impulse buying, Positive attitude, Browsing behavior, Live streaming, Use and gratification theory

Paper type Research paper

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1. Introduction

In the post-epidemic era, where the economic climate has tumbled, 5G communication technology is driving manufacturers and specialty brands to progressively embrace streaming media to find new working scenarios for the digitization and sustainability of e-commerce. Against this backdrop, social media-based cross-border e-commerce live shopping has emerged, where consumers are encouraged to complete transactions and settlements for exotic goods and services via live streaming in the digital ecosystem (HSBC, 2023; Guo et al., 2021). Compared to traditional e-commerce, cross-border e-commerce live streaming breaks down geographical and time zone constraints, allowing consumers to complete transactions more efficiently through a real-time streaming platform (Guo et al., 2021; Xu et al., 2021). Cross-border e-commerce live shopping has significantly eased market pressures and had a profound impact on the consumer market, especially in Europe (Tolstoy et al., 2023) and Asia (Liu et al., 2021), where billions of consumers have become followers of cross-border e-commerce shopping, and 48.4% of millennials have become guests and mainstays of live e-commerce (iResearch, 2022). The HSBC (2023) indicates that cross-border e-commerce live streaming is a robust way to establish overseas trade and that social commerce (e.g. Little Red Book) and traditional e-commerce (e.g. Amazon and Taobao) injected nearly a trillion dollars of benefits into cross-border e-commerce live streaming in 2023. Unlike social commerce and traditional e-commerce, which focus on directing consumers to local products and enhancing the efficiency of their purchases through, for example, social interactions, cross-border e-commerce assists consumers in purchasing cross-border goods online, which further broadens the scope of their purchases. McKinsey (2022) declares that the cross-border e-commerce market has huge potential, and is projected to reach a staggering $2tn in seven years’ time.

Cross-border e-commerce is a business paradigm dependent on e-commerce, which sells products or services to consumers by means of information technology such as digital transactions, cross-border customs clearance, online payments and tracking services (Chen et al., 2023). The ultimate goal of cross-border e-commerce is to deliver goods or services to consumers and lead them to purchase behavior (Li et al., 2022; Zhu et al., 2019). In a socially interactive shopping environment, consumers are mostly inclined to spend on impulse, and real-time live streaming, in particular, stimulates unplanned impulsive behavior, which contributes to 80% of online sales volume (Gao et al., 2022). Narrowly defined, impulsive buying is a behavior of unplanned urgency to buy that is subject to external stimuli and is easily triggered in an online environment (Akram et al., 2018; Kimiagari and Malafe, 2021; Redine et al., 2023; Zafar et al., 2021). Particularly in live streaming commerce, environmental stimuli or demand factors motivate consumers to make impulse spending plans; in other words, the formation of impulsive buying is inextricably linked to external stimuli and usage factors (Li et al., 2023; Yan et al., 2023). Although this behavior has been previously highlighted, it remains a thorny issue in the field of consumer behavior (Ahmed et al., 2020; Goel et al., 2022). Existing literature examines the attributes and functions (Liu et al., 2021; Tolstoy et al., 2023) and organizational performance (Chen et al., 2023) of cross-border e-commerce platforms, and the causal relationship between e-commerce live and purchasing behavior (Gao et al., 2022; Guo et al., 2021; Shang et al., 2023; Xu et al., 2021), but ignores the formation mechanisms of impulsive purchases in the context of cross-border e-commerce live streaming, as well as the determinants that stimulate consumers’ use of this streaming medium. Live streaming is a remote practice of social interaction that uses 5G communication technology to deliver sound, virtual video, graphics, and other information to consumers as a way to achieve a two-way connection between buyers and sellers (Chen et al., 2022b; Liu, 2022; Yan et al., 2023). Streamer, viewer and product are the three core elements in a live streaming scenario (Chandruangphen et al., 2022). For instance, in TikTok Live, the streamer is the person in charge of the real-time streaming, who will explain the content of the product or service to the viewer through self-expression, text and video, and the viewer usually
interacts with the anchor and other consumers online through messages, emojis, likes, retweets and so on. Recent work (Leong et al., 2023) suggests that live streaming significantly enhances buyers’ perceived value, which leads to the establishment of cognitive trust in the streaming media and then guides individuals’ shopping behavior, but there is little evidence to date that reveals whether individuals’ impulsive behaviors in cross-border e-commerce live streaming media are influenced by, among other things, perceived gratification, perceived interactivity, perceived enjoyment, perceived information usefulness and internal attitudes. Perceived stimuli (Shang et al., 2023; Sumi and Ahmed, 2022) and consumer attitudes (Bawack et al., 2023) have been shown to be significant antecedents in the activation of online purchasing behavior, particularly in relation to gratification (Woo and Kim, 2019), interaction (Hossain et al., 2019), enjoyment (Akram et al., 2018) and informational usefulness (Sun et al., 2020), yet the theoretical relationship between these factors and impulse purchasing has little previously been explored in cross-border e-commerce live streaming environments. While prior evidence has demonstrated that socialization, information and enjoyment needs (Sun et al., 2020), social and value identification (Bawack et al., 2023), product-related stimuli (Zhu et al., 2020), navigation, relaxation and leisure needs (Menon, 2022) and utilitarian and hedonic gratification needs (Hossain et al., 2019) motivate consumers to use and engage with online media, few publications have empirically analyzed the reasons why consumers use cross-border e-commerce live streaming and the impact of usage factors on consumer attitudes and impulsive buying. Consumers typically engage in online social activities for both hedonic and utilitarian purposes (Zheng et al., 2019), and both are direct factors that motivate consumer decision-making (Hossain et al., 2019), but the indirect roles of hedonic and utilitarian browsing in the relationship between individual attitudes and purchasing behavior have been underestimated, especially as few studies have focused on exploring the role of both of them in stimulating impulse purchases in the context of streaming media. Iglesias-Pradas and Acquila-Natale (2023) have recently emphasized consumer decision-making and shopping behavior in e-commerce environments as urgent academic issues for marketers.

Hence, to fill the gap, a conceptual framework based on the use and gratification (U&G) perspective that combines the adoption factors, personal attitudes and behavioral consequences is proposed, which extends the U&G lens and captures the theoretical relationship between perceived gratification, consumer attitudes, browsing factors and impulsive purchases. The present work focuses on exploring the direct and indirect relationships between cross-border e-commerce live streaming demand factors, individual attitudes and behavioral decisions at the levels of perceived interactivity, perceived enjoyment, perceived emotional fulfillment and perceived information usefulness, which have been overlooked by previous studies (Bawack et al., 2023; Hossain et al., 2019; Gao et al., 2022; Kaur et al., 2020; Li et al., 2023; Menon, 2022; Santos Corrada et al., 2020; Xu et al., 2021; Zhu et al., 2020). Additionally, this work focuses on the mediating role of hedonic and utilitarian browsing between individual attitudes and impulse purchases in the context of cross-border e-commerce live streaming, an effects pathway that has also been neglected by previous work (Zhang et al., 2018; Zheng et al., 2019). Specifically, this study would address a threefold research question (RQ):

**RQ1.** What is the relationship between perceived gratification, consumer attitudes, browsing behavior and impulsive buying in cross-border e-commerce live streaming scenarios?

**RQ2.** What is the formation mechanism of consumer impulsive buying in cross-border e-commerce live streaming scenarios?
RQ3. Do hedonic and utilitarian browsing mediate the relationship between consumer attitudes and impulsive buying in cross-border e-commerce live streaming scenarios?

2. Literature review and hypothesis formulation

2.1 Cross-border e-commerce live streaming

Cross-border e-commerce is a means of international business activity that accounts for 20% of the e-commerce market share, and it allows transacting entities in different geographies to complete digital transactions through e-commerce platforms, real-time negotiations and cross-border settlements, and ultimately deliver cross-border products to customers (Zhu et al., 2019). In recent years, cross-border e-commerce platforms have commenced to introduce live-streaming features. Narrowly defined, cross-border e-commerce live streaming is a hybrid of live streaming and cross-border e-commerce, which achieves the purpose of assisting consumers in different regions to purchase cross-border goods through live streaming interaction (Guo et al., 2021; Li et al., 2022; Xu et al., 2021). In this scenario, buyers can quickly purchase overseas products, and sellers can display detailed information about their products in the countries of origin; overseas factories can sell their products or services directly to consumers, increasing the efficiency of consumer purchases; and overseas anchors or labels stimulate consumer purchases through real-time remote interactions. The four distinguishing types of cross-border e-commerce live streaming include sellers’ online direct sales, original factory live streaming, Q&A with buyers and overseas sellers, and executive sales pitches (William, 2022). The first three categories involve live interactions in which the anchor gathers information about the consumer’s shopping needs and then shows them more details about the product or service. The sellers in cross-border e-commerce live streaming can be both corporate organizations and international brand representatives, as well as individual sellers, who collectively sell cross-border goods to online buyers through bonded warehouses or direct mail, for example (Li et al., 2022). The last one involves the direct participation of the company’s management, which is designed to stimulate the consumer’s interest and desire to buy (William, 2022).

Current research on cross-border e-commerce live streaming can be broadly divided into two directions, one exploring the functions and attributes of live streaming (Liu et al., 2021; William, 2022; Tolstoy et al., 2023), and the other exploring the antecedents that drive consumer engagement in live streaming (Chen et al., 2022a; Shang et al., 2023; Sun et al., 2019; Xu et al., 2021; Zhang et al., 2020; Zhang et al., 2023). Although many scholars (Chen et al., 2022a; Guo et al., 2021; Seo and Yoh, 2022; Sun et al., 2019; Zhang et al., 2020) hold positive views on the relationship between live streaming and consumer behavior, there are also opponents (Xu et al., 2021). Through literature screening (Chen et al., 2022a; Guo et al., 2021; Liu et al., 2021; Seo and Yoh, 2022; Sun et al., 2019; Tolstoy et al., 2023; William, 2022; Zhang et al., 2020), the extant work mainly analyzes the functional attributes of cross-border e-commerce live streaming and the influencing factors of purchasing behavior. Unlike the prior, this study investigates the drivers of consumer adoption of cross-border e-commerce live streaming as well as the formation mechanism of impulsive purchasing based on the U&G theory in terms of consumer perceived, attitudinal, and behavioral outcomes.

2.2 Uses and gratification theory

As a sociological paradigm, U&G theory explains the motivations and reasons why target-driven audiences choose traditional media (e.g. television and newspapers) (Katz et al., 1973; Ruggiero, 2000) or online media (e.g. social media, online streaming) (Urista et al., 2009; Sun et al., 2020), and further explains what antecedents drive
individual behavior (Lim and Ting, 2012; Menon, 2022; Santos Corrada et al., 2020). Recent works applied this theory to emerging media channels such as live streams (Bawack et al., 2023), social networking sites (Urista et al., 2009), wireless live messaging apps (Kaur et al., 2020), Facebook (Hossain et al., 2019), over-the-top video streaming (Menon, 2022) and internet media (Lim and Ting, 2012; Sun et al., 2020) to examine the antecedents and consequences that drive individuals’ use of media.

Based on U&G, one of the reasons people adopt virtual media is to satisfy personalized social needs, and factors related to perceived interactivity can motivate people to respond positively to social platforms and generate a willingness to use them (Bawack et al., 2023; Hossain et al., 2019). Individuals are cognitively motivated to use media to maintain interpersonal and social relationships (Moon and An, 2022; Urista et al., 2009). In cross-border e-commerce live streaming, consumers perceive social interactions with sellers and other buyers by sending instant messages and popping up comments and likes. Media users attempt to build rapport with other buyers by posting and sharing personal shopping experiences (Kaur et al., 2020). Li et al. (2022) indicate that e-commerce interactions help stimulate consumer herd mentality. Through gift purchases, likes and follows, bonuses and coupons, sellers allow consumers to perceive shopping interactions, which in turn stimulate online transactions. Liu (2022) suggests that the interactive nature of e-commerce live streaming drives consumers to engage in real-time interactions with the anchor or other viewers, which greatly reduces the risk of making a purchase and significantly increases purchase intent (Guo et al., 2021).

cFurthermore, when exposed to media, the perception of useful information drives consumers to stay on the media interface and create a willingness to use it further (Hossain et al., 2019; Lim and Ting, 2012; Sun et al., 2020; Urista et al., 2009). Perceived information usefulness is defined as an individual’s overall assessment of the availability of external information and consciously drawing on external information to assist in solving specific problems (Kaur et al., 2020; Sumi and Ahmed, 2022). Individuals on social platforms would actively seek external information associated with the purchasing task, and when perceiving usability information such as voice and shopping support (Sun et al., 2019) and product and service information (Räsänen et al., 2021), individuals would react positively to the platforms (Hossain et al., 2019; Lim and Ting, 2012; Sumi and Ahmed, 2022), which in turn induces consumers to make unplanned purchase decisions (Do et al., 2020). Räsänen et al. (2021) assert that nearly half of consumers would locate valuable information about a product or service from a variety of sources (e.g. store materials and peer reviews) before making a purchase. Zafar et al. (2020) indicate that the quest for useful information not only contributes to the development of positive social relationships but may further lead to impulse purchases. If consumers are able to perceive information that fulfills their shopping needs from the vast amount of live content, then a positive buying response will occur (Zhang et al., 2023).

Moreover, individuals expect to gain affective satisfaction during media use by placing their emotions in the medium or using the medium to release their emotions (Katz et al., 1973). Prior literature (Bartsch and Viehoff, 2010) defines affective gratification as the antecedents that drive individuals to internal states and behavioral outcomes, and its value is reflected in its ability to promote attitudes toward things and trigger purchase intentions (Woo and Kim, 2019). Bartsch and Viehoff (2010) emphasize that emotions can satisfy different levels of media users, whether they are rational, moral or hedonistic. Kaur et al. (2020) and Woo and Kim (2019) also accepted that emotions could lead to positive attitudes toward objects and thus trigger shopping intentions among media users.

Further, perceived enjoyment, a predictor of consumer media use, focuses on assessing the fun and pleasure individuals feel when engaging in media interactions (Kaur et al., 2020; Lim and Ting, 2012; Sumi and Ahmed, 2022). The enjoyment motive fulfills, to some extent, an individual’s need
to escape reality, enhance relationships or kill uninteresting time (Bartsch and Viehoff, 2010; Moon and An, 2022). In an online interactive environment, Akram et al. (2018) emphasize that enjoyment-based shopping relieves social pressure and stimulates consumers to make impulsive decisions. Actions such as sharing links with others or getting in touch with other buyers can help individuals release psychological and social stress (Li et al., 2022). Do et al. (2020) suggest that social interactions and the availability of information on a virtual mobile interactive platform stimulate positive individual responses, such as increased satisfaction and enjoyment, which activate impulse purchases. Bawack et al. (2023) propose that consumers’ willingness to shop on streaming platforms is governed by their personal attitudes toward media and brands, and that attitudes are driven by multiple demand factors. In the context of cross-border e-commerce live streaming, Guo et al. (2021) asserted that perceived-related factors contribute to positive beliefs and positive behavioral outcomes of consumers toward cross-border e-commerce live streaming and significantly contribute to consumer purchasing behavior. Similarly, Yan et al. (2023) found that perception-related constructs significantly contributed to positive consumer attitudes toward e-commerce streaming and further activated impulse purchases.

Based on the disclosed literature, four research hypotheses were formed as shown below:

H1. Perceived interactivity has a positive impact on consumers’ positive attitudes toward cross-border e-commerce live streaming.

H2. Perceived information usefulness has a positive impact on consumers’ positive attitudes toward cross-border e-commerce live streaming.

H3. Perceived affective gratification has a positive impact on consumers’ positive attitudes toward cross-border e-commerce live streaming.

H4. Perceived enjoyment has a positive impact on consumers’ positive attitudes toward cross-border e-commerce live streaming.

2.3 Positive attitude and impulsive buying

Attitude is an internal mental activity or state of perception that precedes an individual’s formation of an opinion or judgment about something objective (Ajzen and Fishbein, 1977), such as the perception of entertainment (Karim et al., 2021), a positive perception of a social media platform (Bawack et al., 2023) or a positive perception of a brand (Christian et al., 2021). When individuals develop a positive attitude toward something or a phenomenon, they do not hesitate to activate social behaviors immediately, such as generating a desire to buy (Seo and Yoh, 2022) or impulse buying (Chan et al., 2017; Yan et al., 2023).

Impulse buying is an unplanned and unconventional shopping behavior (Goel et al., 2022; Redine et al., 2023) that occurs when an individual is exposed to an external stimulus such as perceived interaction and perceived usefulness (Do et al., 2020), emotional and cognitive needs (Verhagen and Van Dolen, 2011) or an environmental stimulus (Akram et al., 2018; Kimiagari and Malafe, 2021; Zafar et al., 2021). Impulse buying behavior is immediate purchasing behavior resulting from exposure to stimuli, and emotional, hedonic, purposive and utility factors can all drive individuals to make unplanned purchases (Beatty and Ferrell, 1998; Park et al., 2012). Prior studies (Do et al., 2020; Gao et al., 2022; Karim et al., 2021; Li et al., 2023; Yan et al., 2023; Zafar et al., 2021) have adopted empirical investigations to assess consumers’ immediate impulsive behaviors. But unlike an actual purchase, an impulse purchase is a sudden behavior that occurs before an actual purchase; it is an irresistible internal sense of impulse generated by the individual (Beatty and Ferrell, 1998) and triggered by multiple enticements on the Web (Akram et al., 2018; Chan et al., 2017; Redine et al., 2023; Karim et al., 2021; Kimiagari and Malafe, 2021;
Verhagen and Van Dolen, 2011). Recent research has highlighted that impulse buying has become a normalized consumer behavioral phenomenon in streaming media (Li et al., 2023; Yan et al., 2023), e-commerce (Christian et al., 2021) and social commerce (Zafar et al., 2021) scenarios. Zhang et al. (2023) show that informativeness, social connections and live environments are significant prerequisites for creating positive consumer attitudes and subsequently transforming consumers from having no intention to buy to having a strong intention to buy. Li et al. (2023) state that consumers’ attitudes toward live streaming determine which purchasing behavior they adopt, and that impulse buying is influenced by utilitarian and hedonic factors. In the context of cross-border e-commerce, Zhu et al. (2020) showed that individuals’ positive responses to streaming e-commerce significantly contributed to unplanned impulse purchases. So, based on the prior literature, the hypothesis is currently formed:

\[ H5. \text{Positive attitudes toward cross-border e-commerce live streaming can positively contribute to impulsive buying.} \]

2.4 Utilitarian and hedonic browsing

The two motivations for online buyers to browse media are utilitarian and hedonistic browsing respectively (Kimiagari and Malafe, 2021; Park et al., 2012; Zhang et al., 2018; Zheng et al., 2019). Goal-oriented consumers tend to use utilitarian strategies to achieve their shopping goals, while those who are shopping for fun, experience and entertainment tend to adopt hedonic browsing strategies (Zheng et al., 2019). Specifically, in the utilitarian mode, consumers use external information (e.g. reviews) and external tools (e.g. advice from others) to directly satisfy their shopping needs; whereas in the hedonic mode, consumers focus on the pleasure of shopping itself and the mental satisfaction of shopping (Zhang et al., 2018). Utilitarian and hedonistic browsing are both direct antecedents that stimulate consumer behavior (Kimiagari and Malafe, 2021; Zhang et al., 2018) and indirect factors between external attributes and behavioral outcomes (Park et al., 2012; Zheng et al., 2019). Zhang et al. (2018) suggest that hedonic and utilitarian values significantly increase the browsing behavior of Chinese consumers, which in turn influences impulse purchases. Hossain et al. (2019) point out that hedonic and utilitarian gratification have a positive impact on consumers’ use of social media, and that factor such as enjoyment, information search and social interactions influence the behavioral intentions of Facebook users. Similarly, Li et al. (2023) conclude that both utilitarianism and hedonism drive impulsivity in streaming media buyers. Zheng et al. (2019) show that hedonistic and utilitarian browsing motivate online consumers to make positive purchases. Utilitarian browsing enhances the desire to buy under the influence of the mediator, while hedonic browsing can directly stimulate individuals to buy. In the cross-border e-commerce scenario, Han and Kim (2019) stated that the occurrence of consumer behavior is influenced by hedonic and utilitarian antecedents, and both of them significantly activate consumers’ purchasing behavior. Hedonism and utilitarianism also play a role in stimulating consumer impulsivity in the context of live streaming media, e.g. Li et al. (2021) found that streaming media users make impulsive purchasing decisions because individuals are driven by pragmatic and hedonistic antecedents. Kimiagari and Malafe (2021) found that both utilitarian and hedonistic shopping behaviors are indirectly associated with impulse buying, and that the two browsing behaviors, hedonic and utilitarian, play different mediating roles between external environmental stimuli and behavioral outcomes. In an online setting, Zheng et al. (2019) asserted that hedonic and utilitarian browsing play different mediating roles between external stimuli and impulse purchases, and that hedonic and utilitarian browsing have a significant impact on activating impulse purchases. However, Leong et al. (2023) found that
only utilitarian values significantly contributed to internal cognition and subsequently activated individual behavior, with hedonic values having a lower impact on streaming buyers. Fu and Hsu (2023) also suggest that utilitarian factors significantly outweigh hedonic factors on impulse purchases in a live streaming context, and that consumers are more inclined to pounce on utilitarian information rather than hedonistic pleasures when engaging in live streaming interactions. Based on the previous, the following direct and indirect effect hypotheses are currently proposed:

$H6$. In a cross-border e-commerce live-streaming context, utilitarian browsing significantly influences impulsive buying.

$H7$. In a cross-border e-commerce live-streaming context, hedonic browsing significantly influences impulsive buying.

$H8$. In a cross-border e-commerce live-streaming context, utilitarian browsing has a mediating effect between positive attitudes and impulse purchases.

$H9$. In a cross-border e-commerce live-streaming context, hedonic browsing has a mediating effect between positive attitudes and impulse purchases.

To conclude, this research extends U&G theory to the cross-border e-commerce live streaming context and develops a new conceptualization model with eight variables (Figure 1) to examine the effects of usage needs relating to perceived gratification on positive attitudes and impulsive purchases, as well as the mediating effect of web browsing behavior between attitudes and behavioral outcomes.

3. Methodology
3.1 Instrument design and pilot testing
A seven-point Likert scale (from strongly disagree to strongly agree) questionnaire was used in this study and sequentially divided into three sections: first, research informational letter,
which presented the basic information about the study and outlined the participants’ legitimate rights during the self-administration process. Second, questionnaire, where each structure adopted three item-reflective indicators to test respondents’ responses to relevant content. Perceived interactivity was referenced to Moon and An (2022), perceived information usefulness and perceived enjoyment were referenced to Sumi and Ahmed (2022) and Hossain et al. (2019), perceived affective fulfillment was referenced to Woo and Kim (2019), positive attitude was derived from Bawack et al. (2023), impulsive buying was derived from Zafar et al. (2021), hedonic and utilitarian browsing were taken from Zheng et al. (2019). To accommodate the research setting, minor linguistic adjustments were made to include “In the context of cross-border e-commerce live streaming [...]” in each measurement item. A screening question was set up, and only respondents who had experienced cross-border e-commerce live shopping were able to pass the screening question. Third, the last section, demographic information, covers anonymous questions such as gender, age and educational attainment.

To assess the validity of the instrument, two professors in the field of e-commerce and marketing assisted in examining the content validity. Then we conducted a pilot test on 60 samples to check the overall quality and stability of the research instrument. Based on Faul et al. (2007), 210 valid sample requirements were calculated by the a priori power analysis of the G*Power software.

3.2 Respondents and data collection

To improve collection efficiency, the investigators used offline questionnaire collection, which was superior to online distribution in terms of recall rate, population coverage and validity (Wiersma, 2013). Through a convenience sampling strategy and cross-sectional design, a total of 550 self-administered questionnaires were distributed to people living in the Klang Valley, Kuala Lumpur, Malaysia. This region was selected because it has a resident population of more than 7 million, which allowed us to quickly and easily collect the required samples (Karim et al., 2021; Lim and Ting, 2012). Convenience sampling is adopted because it allows for faster access to the target sample within a limited time frame as well as relieves financial pressures. The results of convenience sampling are more credible if the research methodology is sound (Andrade, 2021). A total of 542 responses were received, but 115 questionnaires were directly removed through data screening, of which 106 were deleted because they were partially missing, blank, overfilled or did not meet the screening questions, and 9 were removed in the Mahalanobis outlier detection. In the end, we received a total of 427 valid questionnaires (the effective rate of return is 77.64%). The effective sample size is within reasonable limits (Faul et al., 2007), and suitable for structural equation modeling (SEM) analysis (Jackson, 2003; Yang et al., 2023).

4. Data results

4.1 Sample profiles

The proportion of male and female participants in the valid sample (Table 1) was 57.14% and 42.86%, respectively, and the majority of the participants were aged 18–29 (49.18%) and 30–39 (29.98%). In terms of educational background, university (37%), college (25.29%) and postgraduate (18.27%) groups occupy the top three positions, with the majority of respondents having a good level of education. In terms of monthly income, the groups that accounted for more were RM5,001–8,000 (37%), RM2,001–5,000 (35.13%) and RM8,001–10, 000 (19.2%). More than half of the respondents said they use cross-border e-commerce live streaming—one to two times per month, 37.47% use it—three to four times and only 6.09% use it more than five times. In addition, the majority of participants reported that they make impulse purchases—one to two
4.2 Reliability and convergent validity

According to the output of SPSS 25, the Cronbach’s alpha and KMO values for perceived interactivity (PI), perceived information usefulness (PQ), perceived affective gratification (PA), perceived enjoyment (PE), positive attitude (PTL), hedonic browsing (HB), utilitarian browsing (UB) and impulsive buying (IB) are greater than 0.8 and 0.7, respectively, which suggests that the sample has a good level of reliability (Hair, 2009). The analytical results of the three metrics (Table 2), loading factors, average variance extracted (AVE) and composite reliability, were above the expected thresholds (Fornell and Larcker, 1981). Concretely, the AVE values ranged from 0.673 to 0.895, and the values of the remaining two indicators were above 0.8.
4.3 Multicollinearity, common bias and discriminant validity

The Harman one-factor test recommended by Podsakoff et al. (2003) was applied, and it was concluded that there was no common method bias issue because the first-factor score was not higher than 50%. Further, the effective samples free from multicollinearity, as the VIF values of all eight variables are below 2 (Table 2). Furthermore, Fornell and Larcker’s (1981) method was used to examine construct differentiation and found that (Table 3) the square root of AVE for each variable located on the diagonal (marked in italics) were all greater than the correlation score for the remaining constructs; thus, the eight variables of PI, PQ, PA, PE, PTL, UB, HB and IB maintained good discriminant validity among themselves.

<table>
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Source: Created by authors

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Table 2. Reliability and validity assessment

Table 3. Discriminant validity assessment results

Note: **Correlation is significant at the 0.01 level (2-tailed)
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4.4 Evaluation of measurement model
The goodness of fit between the model and the dataset was observed through a variety of evaluation metrics, and the results showed that all metrics (e.g. GFI = 0.926, AGFI = 0.907, NFI = 0.978, RFI = 0.974, IFI = 0.991, TLI = 0.989, CFI = 0.991, RMSEA = 0.04 and $\chi^2$/df = 1.68) were in ideal condition (Hair, 2009). In addition, the path coefficients (Figure 2) show that positive attitudes, utilitarian browsing, hedonic browsing and impulsive buying have 42%, 31%, 18% and 43% of the model’s explanatory power, respectively.

4.5 Evaluation of structural model
AMOS-SEM technique was performed to assess the level of significance of the hypothesized pathways (Anderson and Gerbing, 1988; Hair, 2009), and the results showed that PI (T = 5.742, $p < 0.001$), PQ (T = 7.245, $p < 0.001$) and PE (T = 6.25, $p < 0.001$) significantly contributed to PTL. Hence, H1, H2 and H4 were established. Besides, PTL (T = 6.647, $p < 0.001$) and UB (T = 8.05, $p < 0.001$) positively influence IB, due to the fact that, H5 and H6 are also recognized. However, the effect of PA (T = 1.774, $p > 0.05$) on PTL was not significant, and the effect of HB (T = 1.296, $p > 0.05$) on IB was insignificant; therefore, H3 and H7 were not established in the direct effects in Table 4.

4.6 Bootstrapping mediating effects
The AMOS-Bootstrap method was used to detect the mediating effects of utilitarian and hedonic browsing, and judgment criteria based on Zhao et al. (2010) were adopted. The results (Table 5) showed that the percentile and bias-corrected (BC) upper and lower bounds of the PTL-UB-IB pathway did not contain 0 and the significance level was less than 0.001 at 5,000 samplings and 95% confidence interval (CI) criteria, thus mediating pathway H8 was established. However, percentile and BC methods showed that the upper and lower bounds of the PTL-HB-IB pathway contained 0 and the significance level was greater than 0.05, thus H9 was rejected.

Figure 2.
Path coefficient results

Note: ***$p < 0.001$
Source: Created by authors
5. Discussion, implication and suggestion

5.1 Key findings

Based on the U&G lens, a conceptual framework was developed and tested which examines the relationship between perceived gratification, consumer attitudes and impulsive purchasing and emphasizes the mediating effects of hedonic and utilitarian browsing between individual attitudes and purchase impulses. According to the empirical outcomes, three research questions were addressed and several innovative findings emerged regarding the direct and indirect effects of the impulsive purchasing formation mechanism.

In terms of direct effects, as hypothesized, the study found that consumers show strong motivation to interact with others on cross-border live shopping platforms. In interactive environments, consumers have a strong desire to establish social relationships with others or sellers, and when streaming consumers perceive social interactions, they would activate positive attitudes toward the media and further motivate consumer behavior. This finding is similar to Liu (2022), Guo et al. (2021), Bawack et al. (2023) and Hossain et al. (2019), which all highlight the positive impact of social interactions on individuals’ positive attitudes and subsequent behaviors. Further, the results indicate that perceived information usefulness significantly drives positive consumer attitudes toward cross-border streaming, which in turn promotes impulse purchases. This result is similar to Lim and Ting (2012), Urista et al. (2009) and Zhang et al. (2023), but different from Kaur et al. (2020). Although Kaur et al. (2020) point out that young Japanese people do not use emerging media and make purchases for the content of the information, the current view is that consumers will respond positively to purchases once they perceive that the information is beneficial to them. Similar to Akram et al. (2018), Do et al. (2020) and Yan et al. (2023), the positive effects of shopping enjoyment on individual attitudes and behaviors are also highlighted in this research. In the context of cross-border live shopping, consumers focus on experiencing the fun and excitement of shopping, and the perception of

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<th>T-values</th>
<th>Significance level</th>
<th>Conclusion</th>
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*Source: Created by authors*

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*Source: Created by authors*
enjoyment drives consumers to hold positive attitudes toward live media, which in turn has the potential to inspire impulse purchases. Contrary to Bartsch and Viehoff (2010), Woo and Kim (2019) and Kaur et al. (2020), however, this work asserts that emotional gratification is not a predictor of consumer media use. Perceived affect gratification does not further influence positive attitudes and impulse purchases in the context of cross-border e-commerce live streaming. Furthermore, this study found that consumers’ inherently positive attitudes toward live streaming platforms can motivate their impulsive buying. This result extends the findings of Lim and Ting (2012) and Seo and Yoh (2022), which previously only discussed the impact of positive attitudes on purchase behavior and did not address impulse purchases. Moreover, in consumer browsing behavior, only utilitarian browsing is currently found to directly promote impulse purchases, while there is no significant association between hedonic browsing and impulse purchases. This result refutes some of the views of Park et al. (2012), Hossain et al. (2019), Kimiagari and Malafe (2021), Zhang et al. (2018), Zheng et al. (2019) and Li et al. (2023). Currently, it is confirmed that consumers tend to browse purposefully in cross-border e-commerce live streaming and do not participate in live streaming purely for hedonic purposes. In other words, consumers will tend to watch live streams with a specific shopping goal in mind, and will make impulse purchases once they capture utilitarian information that fulfills their shopping needs. This opinion intersects with Leong et al. (2023) and Fu and Hsu (2023) in that we both emphasize that utilitarian behaviors significantly outweigh hedonic behaviors for streaming buyers. Further, as with others (Chen et al., 2022; Guo et al., 2021; Liu, 2022; Sun et al., 2019; Zhang et al., 2020; Zhang et al., 2023), this research alludes to the positive relationship between live-streaming and purchase behavior. This research believes that impulsive purchasing has become a universal consumer behavior in online media channel, a finding that is consistent with Akram et al. (2018), Chan et al. (2017), Christian et al. (2021), Zafar et al. (2020) and Zafar et al. (2021).

In terms of indirect effects, the present work revealed that utilitarian browsing significantly mediated the relationship between positive attitudes and impulse buying, but hedonic browsing did not enhance the relationship between individual attitudes and behavioral outcomes. In the context of cross-border e-commerce live streaming, consumers do not make impulse purchases as a result of hedonic browsing, although perceived enjoyment motivates consumers to use streaming and further stimulates a positive attitude. Unlike consumers in developed countries (Park et al., 2012), consumers in developing countries focus more on utilitarian information than on hedonic elements, and purposeful shopping information enhances the impulse to buy. Further, unlike other media (Hossain et al., 2019; Kimiagari and Malafe, 2021; Zhang et al., 2018; Zheng et al., 2019), consumers tend to pounce on utilitarian shopping information in cross-border live shopping environments, and consumers tend to complete purchases quickly in a target-driven manner. Although positive reactions among consumers can directly boost purchase impulses, utilitarian browsing significantly enhances the association between the two of them.

5.2 Research implications

Theoretically, in the context of cross-border e-commerce live streaming, the theoretical relationship between adoption motivations, individual attitudes and behavioral outcomes is captured through a conceptual framework and, in doing so, enhances the explanatory connotations of U&G theory. The findings revolutionize the previous knowledge and currently suggest that consumers’ impulsive buying behavior is influenced by perceived interactivity, perceived usefulness of information, perceived enjoyment, positive attitude and utilitarian browsing. However, affective gratification and hedonic browsing do not play any role in
individual attitudes and impulse purchases. Of all the constructs, information usefulness ($t$-values = 7.245) had the greatest effect on positive attitudes, followed by perceived enjoyment ($t$-values = 6.25) and perceived interactivity ($t$-values = 5.742). To the best of our knowledge, this is one of the earlier empirical works that proposes the influence mechanism of impulsive purchasing in cross-border e-commerce live streaming as well as investigating the motivation of consumers to adopt this live streaming media. This work makes a substantial contribution to the understanding of consumers’ motivations for using virtual media and the impact of motivational factors on consumer attitudes, as well as the mechanisms that shape consumer impulsive purchasing. Consumers seek shopping efficiency in e-commerce environments, but this research found that consumers seek more perceptual stimulation in cross-border e-commerce live streaming environments. Consumers choose to participate in cross-border e-commerce live streaming to fulfill hedonic, interactive and informational utility needs, and perceived stimuli related to hedonic, interactive and informational factors significantly enhance individuals’ positive attitudes toward streaming and, in turn, motivate impulse purchases. Unlike e-commerce, this research identified the formation mechanism of impulsive purchasing in a cross-border e-commerce live streaming environment as perceived stimulus – positive attitude – utilitarian browsing – impulsive buying. Perceived stimuli such as perceived interactivity, perceived enjoyment and information usefulness are the antecedents of consumer adoption of cross-border e-commerce live streaming, a finding that enhances the streaming media and consumer behavior literature.

At the practical level, e-commerce practitioners and social media marketers are undoubtedly the beneficiaries, as the results of the research provide a strong reference for the development of marketing strategies for live streaming media. Based on the findings, practitioners can identify the three antecedents that drive individual positive attitudes (i.e. social interactions, usefulness of information and perceived enjoyment) as well as the factors that drive impulse purchases (i.e. positive consumer attitudes and utilitarian browsing). With these discoveries, practitioners can clearly capture user needs and stimulate online consumers to engage in cross-border e-commerce live shopping. As the empirical data is mainly collected from Malaysia at this point, the results of the study provide a reference for Malaysian business organizations to explore consumer behavior to a certain extent. Perhaps, business organizations could learn from this work about consumer perceptions of streaming media usage and the mechanisms that shape consumer impulsive buying. Based on the empirical results, it is currently recommended that e-commerce should emphasize the role of social interaction, information quality, live enjoyment, positive attitudes and utilitarian information in driving individuals to make impulse purchases. When merchants are in a live streaming state, it is important to maintain as close an interactive relationship as possible with consumers and to build long-term intimate social relationships; to unleash purposeful, rather than entertaining, information about products and services to consumers; and to create as relaxed and comfortable atmosphere as possible as a means of motivating a positive purchasing attitude in consumers. In addition, e-commerce marketers should focus on the direct and indirect effects of positive attitude responses and utilitarian browsing on impulse purchases. When in a live streaming state, it is necessary to pay attention to the consumer’s attitudinal feedback to the media and offer effective support for the consumer to accomplish their shopping goals.

In terms of social implications, the current findings help incentivize industrial upgrading and consumption innovation in the cross-border e-commerce live streaming industry; currently provide new perspectives on product and service innovation for brands and upstream and downstream supply chains; and inspire the industry to improve people’s quality of life by providing consumers with high-quality overseas products and services.
Policymakers may update the market strategy of cross-border e-commerce live streaming in terms of perceived interactivity, perceived enjoyment, perceived usefulness of information, positive attitudes, and pragmatic browsing behaviors and, consequently, promote positive social impacts in the sector. In addition, the findings provide new angles for e-commerce practitioners to understand emerging live commerce, and practitioners will draw from the findings to realize the positive contribution of factors related to interaction, information perception, hedonics, internal reactions and browsing behaviors to consumer behaviors, and use this finding to enhance consumer strategies. For marketing educators, the research results advance the discipline of marketing and consumer behavior and provide valuable theoretical knowledge and empirical experience for understanding impulse buying behavior in a streaming context. By exploring the theoretical relationships between perceived stimuli, individual attitudes and impulse buying, the current research supports human understanding of consumer behavior phenomena in the context of cross-border e-commerce live streaming.

5.3 Limitations and future suggestions
Despite contributing new knowledge to the field of impulsive buying and cross-border e-commerce, it must be acknowledged that there are some limitations to this work. First, based on the U&G perspective, the conceptual framework only discusses perceived interactivity, perceived information usefulness, emotional perception and perceived enjoyment; other perceptual factors have not been explored. Perhaps future scholars can focus on other factors that motivate people to use streaming media platforms, such as environmental or technological factors. Second, due to financial constraints, empirical data were collected only from the Klang Valley area of Kuala Lumpur, Malaysia through a convenience sampling strategy. This directly implies that the current findings may be difficult to generalize to other cultural contexts. We strongly recommend that subsequent marketers collect empirical data from other countries or other cultural contexts to shed new light on exploring consumer behavior in the context of emerging media channels. Meanwhile, we expect that the subsequent works adopt other sampling methods to collect empirical data so as to capture new knowledge on the subject of cross-border e-commerce live streaming. Last but not least, this work only employed a quantitative research method, i.e. a questionnaire, to examine the influence of perceived factors on impulse buying. Perhaps future researchers could consider adopting qualitative methods, such as field studies, interviews or focus groups or mixed methods, as a way to provide different insights into understanding impulsive purchasing in a cross-border e-commerce environment.

References


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