Jurnal Organisasi dan Manajemen
Journal Homepage : http://jurnal.ut.ac.id/index.php/JOM

Managing perceived uncertainty and boosting purchase intention through live-streaming marketing elements

Wana Pramudyawardana Kusuma Negara[1*], Tri Esti Rahayuningtyas[1], Widyatmoko[1], An'nin Firnanda Mustofa Putri[1], Aurellia Benicta[1], Stivani Dima Octani[1], Teuku Abrar[2]
1. Department of Management, Faculty of Economics and Business, Universitas Dian Nuswantoro, Indonesia
2. Business School, University of Auckland, New Zealand
*Corresponding author e-mail: wana.pramudya@dsn.dinus.ac.id

Article Info

Keywords:
Perceived uncertainty;
Purchase intention;
Live-streaming marketing

JEL Classification:
D83, L86, M31

DOI:
10.33830/jom.v21i1.9787.2025

Article History
Received: August 29, 2024
Accepted: April 23, 2025
Publish: April 26, 2025

Abstract

Purpose – This study investigated the impact of live-streaming marketing elements on perceived uncertainty and purchase intentions. Live-streaming marketing elements examined include live-streamer competence, online traffic, information usefulness, and product scarcity.

Methodology – The object of this study is businesses engaged in live-streaming commerce through both e-marketplace platforms and social media channels. A total of 418 respondents participated in the online survey. Data analysis was conducted using Partial Least Square-Structural Equation Modeling (PLS-SEM).

Findings – Findings indicate that perceived uncertainty negatively affects purchase intentions, while live-streamer competence, information usefulness, and online traffic positively influence purchase intentions. Specifically, information usefulness reduces perceived uncertainty, whereas product scarcity increases perceived uncertainty.

Originality – This study highlights the importance of addressing perceived uncertainty through effective live-streaming marketing elements to boost consumer purchase intentions. This study includes the dimension of product scarcity into the live-streaming marketing elements, based on the Yale Model, which has not been explored in prior research.

1. Introduction

Live-streaming commerce is currently experiencing significant growth and expansion on a worldwide scale (Lin et al., 2021). As an emerging online shopping channel, it has become a widely used marketing tool due to its effectiveness in driving online sales growth (Ma, 2021; M. Zhang et al., 2021a). Numerous social media in Indonesia have integrated live-streaming features into their business operations, including Shopee Live, Tokopedia Play, Lazada Live, BukaLive, and TikTok Live. E-marketplaces like Shopee have embraced this trend by launching Shopee Live, and TikTok has introduced TikTok Live. This trend has motivated many businesses to adopt these features. Businesses use live streaming to promote their products directly through interactions with viewers, who are potential buyers (Fei et al., 2021). This development signifies that live-streaming commerce has emerged as a novel strategy for online product promotion (Zhang et al., 2023).

Many businesses are adopting live-streaming commerce methods to expand their marketing strategy, enhance marketing effectiveness, elevate service quality and draw in more customers (Tong et al., 2022; Zhang et al., 2021b). According to a survey by Populix (2023), the competition in live-streaming commerce in Indonesia, based on average transactions, is dominated by Shopee Live at 56%, followed by TikTok Live at 30%, Tokopedia Play at 8%, and LazLive at 6%. When considering the most frequently used platforms, Shopee Live still leads with 69%, followed by TikTok Live at 25%, Tokopedia Play at 4%, and LazLive at 2%. This indicates not only the business side but also the growing number of customers shopping through live-streaming commerce, as it provides satisfaction and fulfills their needs (Y. Li et al., 2021).

In live-streaming commerce, businesses attempt to provide electronic services by showcasing their authentic products and demonstrating them to provide consumers with accurate, interactive, and comprehensive product information online (Tong et al., 2022). According to (Wongkitrungrueng et al., 2020), businesses try to influence consumers to make purchases by leveraging various elements of live-streaming commerce marketing. These various elements in live-streaming commerce practice generally focus on three elements of information dissemination proposed by the Yale model: source (who delivers the information), context (the environment or situation in which information is shared), and content (the quality and relevance of the information itself) (Hovland et al., 1954). In this study, the elements of live-streaming marketing are connected and identified with the three components of the Yale Model of information dissemination, based on the research by Chen & Zhang (2023). These components include the live-streamer competence (source), online traffic (context), and information usefulness (content). Also, this study adds product scarcity as a context (Yale Model) into live-streaming marketing elements. The understanding of the sale of products by marketers to customers is framed as a process of information distribution, where the transmission of information from the source (marketer) to the recipient (consumer) is effected through the information shared by marketers to attract customers (Li, 2017). The Yale Model, formulated by Hovland et al. (1954), is characterized by three principal components that are recognized to affect the adoption behavior of information by recipients: source, context, and content. Various studies have been conducted to identify and correlate these components of information, as delineated by the Yale Model, with marketing elements within specific scenarios. (Chang & Wu, 2014; Chen & Zhang, 2023; Li, 2017).

In live-streaming commerce, the live-streamer plays as the main source of marketing information, as they are directly responsible for introducing the product, discussing with customers, and informing product prices (Lu & Chen, 2021). Nevertheless, the competence and performance of the live-streamer play a key role in shaping consumers' buying intentions. Additionally, the amoung of viewers joining in live-streaming commerce and interactive chat reflects online traffic (Gao et al., 2021), which can persuade customers toward buying intentions (Chen & Zhang, 2023). In live-streaming commerce, customers can only gather comprehensive information about the product through their discussion with the live-streamer. Furthermore, the level of information usefulness (Saffanah et al., 2023) regarding the information provided by the live-streamer also affects consumers' purchase intentions. Information usefulness refers to the degree to which consumers perceive that the marketing channel provides accurate and useful information (live-streaming commerce) helps them evaluate the product. In this context, information usefulness reflects the channel’s ability to deliver relevant product information and allows consumers to accurately assess the product’s quality (Yi et al., 2017). Moreover, the strategy of showcasing product scarcity (limited products) is one of the most common strategies to attract consumers to make immediate purchase intentions (Chen & Zhang, 2023). Businesses

often convey that the availability of products sold in live-streaming commerce is very limited, which encourages consumers to make a purchase quickly.

Live-streaming commerce poses challenges for both businesses and consumers. A survey conducted by Rakuten Insight (2024) revealed that 47 percent of respondents preferred shopping in physical stores due to doubts about the products promoted by streamers, 30 percent expressed skepticism regarding products endorsed by streamers, and 29 percent found it challenging to communicate with streamers due to the high volume of viewers. Previously, Statista (2023) also highlighted several challenges associated with online shopping in Indonesia, including 37,61 percent of respondents citing a lack of guarantees regarding product quality, 36.93 percent expressing confusion about after-sales services (such as exchange, return, and refund policies), and 21.92 percent perceiving live-streaming marketing activities as deceptive. These findings indicate a high level of uncertainty among consumers in the context of live-streaming commerce.

According to Daignault et al. (2002) and Kim et al. (2005), the inability of consumers to physically inspect or evaluate products in online shopping environments heightens uncertainty and introduces potential risks. A Populix survey (2022) further corroborated these concerns, noting that consumers hesitate to shop online because they are unable to see or try products before purchasing, coupled with uncertainties about the suitability of the products offered. Within the benefit-risk framework, consumers frequently face trade-offs between deriving advantages and mitigating risks during their decision-making process (J.-M. Lee & Kim, 2020). Effective marketing strategies are necessary to influence consumer perceptions of these benefits and risks (Lee & Kim, 2020). Live-streaming commerce functions similarly to promotional activities, where product pricing often becomes a key point of interest for consumers who assess the value of such offers. However, a significant challenge remains in that consumers do not have physical access to the products featured in live-streaming commerce. This absence of tangible interaction heightens uncertainty about whether the products will meet consumer expectations and perceptions, as determined by the marketing strategies implemented by businesses in these live-streaming events (Chen & Zhang, 2023).

The findings from the surveys conducted by Rakuten Insight (2024), Statista (2023), and Populix (2022) highlight a significant gap in the existing literature on live-streaming commerce, particularly concerning the high levels of consumer uncertainty and the challenges associated with the inability to physically inspect products. While prior research, such as that by Daignault et al. (2002) and Kim et al. (2005), has established that the lack of physical interaction with products in online shopping environments increases uncertainty and risk, the specific dynamics of live-streaming commerce remain underexplored. This gap is further emphasized by the unique challenges identified in the Indonesian context, such as skepticism toward streamer-endorsed products, confusion about after-sales services, and perceptions of deceptive marketing practices. These issues underscore the need for a more nuanced understanding of how live-streaming commerce influences consumer behavior, particularly in emerging markets.

The novelty of this research lies in its modification of existing research models (Chen & Zhang, 2023; Zhang et al., 2023) by introducing product scarcity as an independent variable alongside live-streamer competence, online traffic, and information usefulness. While previous studies have examined the role of live-streamer competence and information usefulness in shaping consumer perceptions, the inclusion of product scarcity as a distinct variable addresses a critical gap in understanding how limited availability influences perceived uncertainty and purchase intention in live-streaming commerce. Additionally, this study uniquely examines the interplay between these independent variables and their direct effects on both perceived uncertainty and purchase intention, as well as the mediating role of perceived uncertainty in shaping purchase

decisions. This approach provides a more comprehensive framework for analyzing the benefit-risk trade-offs that consumers face in live-streaming commerce, as highlighted by Lee and Kim (2020).

By focusing on the consequences of perceived uncertainty on purchase intention, this research contributes to the broader discourse on consumer behavior in digital commerce. It addresses the practical challenges businesses face in mitigating consumer skepticism and enhancing trust in live-streaming environments. Furthermore, the study's emphasis on the Indonesian market adds a regional dimension to the global understanding of live-streaming commerce, offering insights that are particularly relevant for emerging economies where digital commerce is rapidly evolving. Overall, this research not only bridges a critical gap in the literature but also introduces a novel framework for analyzing the complex dynamics of live-streaming commerce, thereby advancing both theoretical and practical knowledge in this domain.

1.1. Information Usefullness

According to Yi et al. (2017), information usefulness is defined by the level of perceived assistance provided by a marketing channel in the evaluation of products. Information usefulness reflects the channel's capacity to deliver pertinent product information and allows consumers to accurately assess product quality (Yi et al., 2017). Huwaida et al. (2024) revealed that information usefulness requires quality information displayed on online shopping platforms. Also, Saffanah et al. (2023) demonstrates that information usefulness must be operationalized through comprehensive and precise product feature descriptions to enhance the effectiveness of live-streaming marketing. In the context of live-streaming commerce, information usefulness is defined as the trust consumers have in the information given by live-streamers to help consumers evaluate product quality (Chen & Zhang, 2023). Sun et al. (2019) note that live-streamers are responsible for timely responses to consumer inquiries, providing product recommendations, guidance, and services tailored to consumer needs. Byun et al. (2021) said that consumers' assessment of information quality conveyed by marketers (live-streamers) can influence their purchasing decisions.

1.2. Product Scarcity

Businesses often communicate that products availibility sold in live-streaming commerce is very limited, which encourages consumers to make immediate purchases (Chen & Zhang, 2023). In this context, product scarcity is described as the consumer's perception of availability of the product (Roy & Sharma, 2015). This can be triggered by particular stimuli given by the business, indicating a limitation in the number of products available (Aggarwal et al., 2011). Also, live-streamers not only present the current availability of products but also repeatedly underscore their high demand. (E.g., bidder count, paying consumer count, and total products sold) (Chen & Zhang, 2023). This approach aims to stimulate and increase consumer awareness of the limitations (scarcity) of product quantities. Product scarcity has emerged as a prevalent marketing tactic in live-streaming commerce. By implementing this tactic, Park et al. (2020) argue that Businesses seek to create a sense of urgency in consumers, accelerating both the speed and volume of transactions.

1.3. Perceived Uncertainty

Consumer behavioral intention is influenced, among other factors, by subjective evaluations related to perceived risk in the decision-making process (Kim et al., 2008). Consumers are bound to gauge the possible risks involved in the purchase process or result, as greater perceived risks

diminish their likelihood to purchase (Kim et al., 2008). According to Zhu et al. (2015), perceived risk uncertainty is a significant antecedent of online purchase intentions among consumers. This perceived uncertainty refers to the negative assessment by consumers due to the lack of product information provided by businesses (Dimoka et al., 2012). In live-streaming commerce, perceived risk uncertainty explains the difficulty users face in objectively evaluating or predicting product quality (K. Lee et al., 2015). Additionally, perceived risk uncertainty also represents consumers' challenge in evaluating whether the live-streamer (business) might deceive them (Hong & Pavlou, 2014).

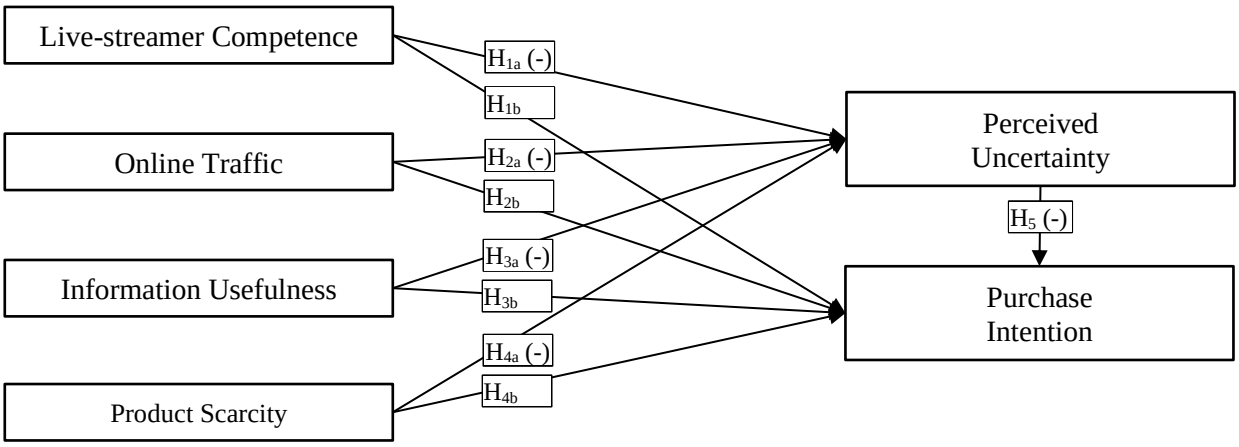

Figure 1. Conceptual Framework

According to Figure 1, this study adapts and modifies the research models from (Chen & Zhang, 2023; X. Zhang et al., 2023) by introducing product scarcity as an independent variable alongside live-streamer competence, online traffic, and information usefulness. While previous studies have explored the roles of live-streamer competence and information usefulness in shaping consumer perceptions, product scarcity addresses a critical gap in understanding how limited availability influences perceived uncertainty and purchase intention in live-streaming commerce. This study uniquely examines the interplay between these four independent variables and their direct effects on both perceived uncertainty and purchase intention, as well as the mediating role of perceived uncertainty in shaping purchase decisions. Specifically, the study investigates the negative effects of live-streamer competence, online traffic, information usefulness, and product scarcity on perceived uncertainty, while also exploring their positive effects on purchase intention. Additionally, the negative consequences of perceived uncertainty on purchase intention are evaluated, providing a comprehensive understanding of the dynamics in live-streaming commerce.

H_{1a}: Live-streamer competence has a negative impact on perceived uncertainty
H_{1b}: Live-streamer competence has a positive impact on purchase intention
H_{2a}: Online traffic has a negative impact on perceived uncertainty
H_{2b}: Online traffic has a positive impact on purchase intention
H_{3a}: Information usefulness has a negative impact on perceived uncertainty
H_{3b}: Information usefulness has a positive impact on purchase intention
H_{4a}: Product scarcity has a negative impact on perceived uncertainty
H_{4b}: Product scarcity has a positive impact on purchase intention
H_5: Perceived uncertainty has a negative impact on purchase intention

2. Research Methods

This study employs a quantitative research approach utilizing survey methodology. The object of this research is on business who engage in live-streaming commerce, whether through e-marketplace platforms offering live-streaming features or social media platforms that also provide live-streaming capabilities. The study population comprises Indonesian consumers engaged with live-streaming shopping platforms, including Shopee Live (Shopee), Tokopedia Play (Tokopedia), BukaLive (Bukalapak), LazLive (Lazada), and TikTok Live (TikTok). Participants aged 17 to 50 years were selected, as this group demonstrates both proficiency in accessing digital commerce platforms and substantial purchasing capacity (Databoks, 2023; Populix, 2021; Kredivo, 2020). Due to the absence of a definitive population framework, the initial sample size could not be precisely determined. Consequently, purposive sampling was employed to ensure the inclusion of respondents who met the eligibility criterion of having participated in at least one live-streaming shopping session in Indonesia (Hulland et al., 2018).

The survey links were disseminated through social media to maintain participant anonymity. In alignment with methodological guidelines for Structural Equation Modeling-Partial Least Squares (SEM-PLS) as data analysis software used, a minimum sample size of 160 was targeted, as proposed by Kock (2018). This threshold was derived using the inverse square root method, which accounts for an effect size of 0.04 to optimize representativeness and statistical adequacy (Kock, 2018). The study ultimately gathered 418 valid responses through a structured questionnaire, distributed across multiple provinces in Indonesia, ensuring geographic diversity and robustness in data collection.

Table 1. Respondent Profile

Profile		Frequency	Percentage (%)
Gender	Female	321	76.8
	Male	97	23.2
Age	17-26	164	39.2
	27-36	223	53.3
	37-49	31	7.4
Live-streaming shopping platform (multiple choice)	Shopee Live	361	86.4
	TikTok Live	302	72.2
	Tokopedia Play	108	25.8
	Lazada Live	130	31.1
	BukaLive	38	9.1
	Others	49	11.7

Source: processed data

The six provinces with the highest number of respondents are West Java (27.3 percent), East Java (19.4 percent), Central Java (16.5 percent), Jakarta (10.5 percent), Banten (6.7 percent), and South Kalimantan (2.4 percent). Additionally, the sample is predominantly female, comprising 76.8 percent, while males constitute 23.2 percent. In terms of age distribution, the largest group is aged 27-36 years, representing 53.3 percent, followed by those aged 17-26 years at 39.2 percent, and those aged 37-49 years at 7.4 percent. Furthermore, regarding preferences for live-streaming shopping platforms, respondents were allowed to select more than one option. Among the 418 respondents, 86.4 percent use Shopee Live, 72.2 percent also use TikTok Live, and 31.1 percent use Lazada Live.

3. Results and Discussions

3.1. Instrument Evaluation

The evaluation of the research instrument (questionnaire) involves testing for validity and reliability. According to Table 2, all items within the constructs of this study are deemed valid as they have loading values greater than 0.708 (Hair et al., 2021). However, two items in the research instrument (OC_2 and PI_1) have loading values less than 0.708, indicating they are invalid and therefore excluded from further analysis. Hair et al. (2021) note that items with loadings in the range of 0.40 to 0.708 may be candidates for elimination, but only if their removal enhances internal consistency reliability or convergent validity. Consequently, OC_2 and PI_1 were excluded from the analysis as their elimination resulted in improved internal consistency reliability and convergent validity. Also, item deletion that causes the construct to have only two items is still acceptable as long as the items have strong outer loadings, meet convergent validity (AVE), and high internal consistency reliability (Cronbach's alpha and Composite Reliability) (Hair et al., 2021).

Table 2. Instrument Evaluation

Item	Construct	Load	AVE	Cronbach's α	CR
	Live-streamer competence (Mannan et al., 2019; Chen dan Zhang, 2023)				
BC_1	I think the live-stremaer are well trained.	0.886			
BC_2	I think live-streamers have expertise in their field.	0.877	0.781	0.860	0.915
BC_3	I think live-streamers have competence in their field.	0.888			
	Information usefulness (Filieri et al., 2018; Chen dan Zhang, 2023)				
IU_1	The information provided by live-streamers helps me to evaluate the products.	0.881			
IU_2	The information provided by live-streamers helps me to get to know the product.	0.870	0.745	0.829	0.897
IU_3	The information provided by live-streamers helps me to understand the quality of the product.	0.838			
	Online Crowded (Byun and Mann, 2011; Chen dan Zhang, 2023)				
OC_1	I think the live-streaming shopping platform looks crowded.	0.900	0.815	0.774	0.898
OC_3	I think there are many shoppers on live-streaming shopping platforms.	0.905			
	Product Scarcity (Teubner Graul, 2020; Chen dan Zhang, 2023)				
PS_1	I think the availability of products offered on the live-streaming shopping platform is limited.	0.874			
PS_2	I think the products sold on the live-streaming shopping platform are selling quickly	0.772	0.713	0.804	0.881
PS_3	I think there are only a few products left to buy on the live-streaming shopping platform.	0.882			
	Perceived Uncertainty (Chen et al., 2021; Chen dan Zhang, 2023)				
PU_1	I am affraid that the products offered on this platform will not meet my expectations	0.845	0.750	0.889	0.923

Item	Construct	Load	AVE	Cronbach's α	CR
PU_2	I feel that there is a high level of uncertainty in shopping for products offered on this platform.	0.882			
PU_3	I feel that the live-streamers on this platform may provide misleading information	0.883			
PU_4	I am affraid that the live-streamers on this platform are trying to deceive me	0.853			
	Purchase Intention (Chen et al., 2017; Chen dan Zhang, 2023)				
PI_2	I intend to buy a product on this platform.	0.942		0.874	
PI_3	I will consider buying a product on this platform.	0.942	0.888		0.941

Source: processed data

Furthermore, this study also assesses convergent and discriminant validity by evaluating the average variance extracted (AVE) and the heterotrait-monotrait ratio of correlations (HTMT). The AVE values for each variable in this study exceed 0.50, indicating that the criteria for convergent validity are met. Similarly, the HTMT values for each variable show scores greater than 0.85 for all correlations with other variables, thereby satisfying the criteria for discriminant validity.

Table 3. Heterotrait-Monotrait Ratio

	BC	IU	OC	PS	PU	PI
BC						
IU	0.716					
OC	0.615	0.587				
PS	0.425	0.285	0.530			
PU	0.105	0.207	0.056	0.306		
PI	0.603	0.603	0.569	0.242	0.196	

Source: processed data

3.2. Model Fit Evaluation

The calculation of convergent validity involved the use of Average Variance Extracted (AVE), Composite Reliability (CR), and item loadings, ensuring that a minimum AVE of 0.50 is present for establishing construct validity. The data presented in Table 3 indicates that the Cronbach's Alpha value ranges from 0.992 to 0.997, consistent with the findings for CR. The values for AVE fall between 0.975 and 0.988, indicating that this measurement significantly exceeds the established threshold for validity test (Henseler et al., 2015).

Table 4. R square

	R Square
Perceived Uncertainty	0.150
Purchase Intention	0.379

Source: processed data

Additionally, this study evaluates goodness-of-fit using the standardized root mean square of residual (SRMR) and the normed fit index (NFI). According to Table 5, the evaluation indicates that the research model meets the required criteria.

Table 5. Goodness of Fit

	Score	Result
Standardized root mean square of residual (SRMR)	0.067	Accepted (<0.10)
Normed fit Index (NF)	0.788	Accepted (close to 1)

Source: processed data

3.3. Hypothesis Testing

The bootstrapping technique, implemented using SmartPLS 3.2 software, was utilized for hypothesis testing in this study. As shown in Table 6, six hypotheses were validated, while three were invalidated. The results of the hypothesis testing revealed that H_{1a} was deemed insignificant (p-value > 5 percent) and thus rejected, whereas H_{1b} was accepted with a path coefficient of 0.260 (p-value < 1 percent). This outcome indicates that live-streamer competence does not influence perceived uncertainty but significantly and positively affects purchase intention.

Table 6. Direct Effects

	Hypothesis	Path Coefficient	T Statistics	P-Values	Decisions
H_{1a}	BC => PU	-0.085	1.662	0.096	Not Supported
H_{1b}	BC => PI	0.260	4.194	0.000	Supported
H_{2a}	OC => PU	-0.026	0.495	0.621	Not Supported
H_{2b}	OC => PI	0.234	4.784	0.000	Supported
H_{3a}	IU => PU	-0.191	3.771	0.000	Supported
H_{3b}	IU => PI	0.232	4.317	0.000	Supported
H_{4a}	PS => PU	0.370	6.137	0.000	Not Supported
H_{4b}	PS => PI	-0.019	0.421	0.673	Not Supported
H_5	PU => PI	-0.099	2.416	0.016	Supported

Source: processed data

The results demonstrated that H_{2a} was rejected due to its insignificance (p-value > 5 percent), whereas H_{2b} was accepted with a path coefficient of 0.234 (p-value < 1 percent). This suggests that while online traffic does not impact perceived uncertainty, it does have a positive and significant effect on purchase intention. The analysis also revealed that H_{3a} was accepted with a path coefficient of -0.191 (p-value < 1 percent), and H_{3b} was accepted with a path coefficient of 0.232 (p-value < 1 percent). This indicates that information usefulness has a significant negative impact on perceived uncertainty and a significant positive effect on purchase intention. Finally, H_{4a} was accepted with a path coefficient of 0.370 (p-value < 1 percent), while H_{4b} was rejected due to its insignificance (p-value > 5 percent).

Table 7. Specific Indirect Effects

Relationship	Path Coefficient	T Statistics	P-Values	Results
BC => PU => PI	0.008	1.261	0.207	Not Significant
OC => PU => PI	0.019	0.460	0.056	Not Significant
IU => PU => PI	0.003	1.911	0.645	Not Significant
PS => PU => PI	-0.036	2.285	0.022	Significant

Source: processed data

This finding suggests that product scarcity significantly increases perceived uncertainty but does not affect purchase intention. Lastly, H_5 was supported with a path coefficient of -0.099 and

significance at the 5 percent level, indicating that perceived uncertainty negatively influences purchase intention. Moreover, this study also evaluated the indirect effects of the variables live-streamer competence, information usefulness, online traffic, and product scarcity on purchase intention through perceived uncertainty. Table 7 indicates that perceived uncertainty does not mediate the relationships between live-streamer competence, online traffic, and information usefulness with purchase intention. However, perceived uncertainty provides full mediation between product scarcity and purchase intention.

3.4. The Effect of Live-Streamer Competence on Perceived Uncertainty and Purchase Intention

This study reveals that live-streamer competence does not significantly influence perceived uncertainty. This finding contrasts with studies conducted by Chen & Zhang (2023), Mannan et al. (2019), Orlowski et al. (2021), and Wang et al. (2020). The results suggest that live-streamer competence may not always effectively mitigate perceived uncertainty among consumers. Even a highly skilled live-streamer might not possess complete or detailed information about every product, particularly in dynamic live-streaming contexts. If there are gaps in product details or if the live-streamer is unable to provide comprehensive answers to specific queries, consumers may still experience uncertainty regarding their purchase decisions. Additionally, in live-streaming shopping, consumers are unable to physically inspect the product. Competence in broadcasting cannot substitute for the tactile experience of touching or trying out a product. The inability to see, feel, or test the product firsthand can contribute to uncertainty, regardless of the live-streamer's skill level.

Conversely, this study confirms that live-streamer competence has a positive and significant effect on purchase intention. This finding aligns with studies by Chen & Zhang (2023), Mannan et al. (2019), Orlowski et al. (2021), and Wang et al. (2020). It suggests that competent live-streamers are often perceived as more knowledgeable and trustworthy. When consumers perceive a live-streamer as skilled and well-informed, they are more likely to trust the quality of the products being presented. This trust can reduce perceived risk and increase the likelihood of making a purchase. Competence encompasses the ability to communicate clearly and persuasively. A skilled live-streamer can present product information in an engaging and convincing manner, addressing potential concerns and highlighting key benefits. Effective communication helps consumers make informed decisions and enhances their likelihood of purchasing. In summary, live-streamer competence influences consumer purchase intention in live-streaming shopping by fostering trust, effectively communicating product value, providing engaging content, and managing viewer interactions professionally. These factors collectively enhance the overall shopping experience and encourage viewers to make purchases.

3.5. The Effect of Online Traffic on Perceived Uncertainty and Purchase Intention

This study reveals that online traffic does not significantly impact perceived uncertainty. This finding contrasts with studies by Chen & Zhang (2023), Mannan et al. (2019), Moharana & Pradhan (2020), and Wang et al. (2020). The results suggest that reducing perceived uncertainty typically necessitates comprehensive and clear information about the product, including its specifications, benefits, and usage instructions. While online traffic may create a sense of excitement or urgency, it does not provide additional detailed or useful information about the product itself. Consequently, consumers may still lack the clarity required to make informed decisions. Additionally, high levels of online traffic can lead to information overload or distraction.

The overwhelming volume of activity might make it difficult for viewers to focus on specific product details or to evaluate the information provided. This distraction can exacerbate uncertainty by diverting attention away from crucial product information, thereby complicating thorough assessment.

On the other hand, this study finds that online traffic has a positive and significant effect on purchase intention. This result aligns with findings from Chen & Zhang (2023), Mannan et al. (2019), Moharana & Pradhan (2020), and Wang et al. (2020). The study indicates that online traffic can enhance the perception of a product's popularity and high demand. When consumers observe numerous other viewers or participants engaging with the live stream or expressing interest in a product, they often interpret this as a signal of the product's quality or desirability. Furthermore, in a crowded live stream, products may receive more attention and visibility due to increased viewer engagement and discussion. The heightened level of interaction—such as live comments, questions, and responses can create a more dynamic and interactive shopping experience. This increased visibility can boost awareness and interest in the product. The greater the discussion and emphasis on a product during the live stream, the more likely it is to capture consumer interest and drive purchase intentions.

3.6. The Effect of Information Usefulness on Perceived Uncertainty and Purchase Intention

This study demonstrates that information usefulness has a negative effect on perceived uncertainty and positive effect on purchase intention. These results are consistent with findings from (Chen & Zhang, 2023; Hernandez et al., 2014; Weathers et al., 2015). Information usefulness refers to the extent to which information aids consumers in accurately evaluating the value, quality, and suitability of a product. High diagnosticity provides clear, detailed, and relevant information about a product, which facilitates more informed decision-making. This clarity helps to reduce perceived uncertainty and risk, thereby increasing consumer confidence in their purchase decisions. When consumers can thoroughly assess a product's features, benefits, and potential drawbacks through comprehensive information, they are more likely to feel assured about proceeding with a purchase. By delivering detailed insights into product quality, usage, and benefits, high diagnosticity mitigates perceived risk associated with the purchase, which can enhance purchase intentions. Consumers are more inclined to complete a purchase when they believe they have sufficient information to make a well-informed decision and minimize potential post-purchase regrets. Additionally, information usefulness provides valuable insights into the product’s specifications, performance, and use cases, allowing consumers to better understand how the product fulfills their needs or addresses their problems. Effective product information supports consumers in comparing options and assessing whether the product offers the value they seek, which can increase the likelihood of purchase if the product meets their criteria.

3.7. The Effect of Product Scarcity on Perceived Uncertainty on Purchase Intention

This study reveals that product scarcity has a positive and significant effect on perceived uncertainty. This finding supports the study by Chen & Zhang (2023), Li et al. (2019), Ma et al., (2018), and Teubner & Graul (2020). The results suggest that product scarcity can increase perceived uncertainty among consumers in live-streaming shopping contexts. When a product is portrayed as scarce—due to limited quantities or high demand—consumers may experience heightened risk. They may fear missing the opportunity to purchase the product if they do not act quickly. This urgency can pressure consumers into making decisions hastily, often without adequate information, thereby increasing uncertainty about whether the purchase is the right

choice. Additionally, scarcity might prompt consumers to question the reasons behind the product's limited availability. They may wonder if the product is being overhyped or if there are underlying issues causing its scarcity. Consumers might perceive a scarce product as either of higher quality or as having undisclosed problems, thus increasing uncertainty about the product's true value and reliability.

Furthermore, the study finds that product scarcity does not significantly influence purchase intention. This result contradicts the study by Chen & Zhang (2023), Li et al. (2019), Ma et al., (2018), and Teubner & Graul (2020). Consumers may prioritize the product's ability to meet their needs and its overall value over the urgency created by scarcity. If the benefits of the product are clear and align with their needs, scarcity may not be a decisive factor. Purchase intention might be more influenced by other elements such as product quality, price, and personal preferences, mediated by information usefulness, rather than by the scarcity of the product. Additionally, if consumers have access to alternative products, the scarcity of a particular product may have less impact. They might opt to explore other options rather than rush a decision based on scarcity. In a competitive market with many available alternatives, the scarcity of one product might not be sufficient to drive purchase intention if other products are easily accessible. Moreover, consumers who are aware of the common use of scarcity as a marketing tactic may become skeptical and less responsive to such strategies. This awareness could diminish the effectiveness of scarcity in influencing purchase intentions.

3.8. The Effect of Perceived Uncertainty on Purchase Intention

This study confirms that perceived uncertainty significantly reduces consumer purchase intention. These findings align with the research conducted by Chen and Zhang (2023), Mannan et al. (2019), and Wang et al. (2017). The results reveal that consumers generally prefer to avoid risk in their purchasing decisions. Perceived uncertainty introduces a sense of risk concerning the product's quality, suitability, or value, which leads consumers to hesitate or delay their purchases. This uncertainty can create anxiety and stress about whether the product will meet their expectations or if the decision to purchase is correct. Such emotional discomfort can deter consumers from finalizing the purchase.

Furthermore, uncertainty can cause consumers to hesitate and delay their purchasing decisions. They may postpone their decision until they gather more information or gain additional clarity, which could result in abandoning the purchase altogether. The greater the perceived uncertainty, the more likely consumers are to procrastinate or avoid making a purchase, ultimately leading to reduced purchase intentions. Additionally, when faced with uncertainty, consumers might seek alternative products or sellers that offer clearer information or lower perceived risk. This behavior can decrease the likelihood of purchasing the product in question. High perceived uncertainty often drives consumers to compare options more extensively, leading them to favor alternatives that provide greater clarity and assurance.

The summary of path analysis reveals significant insights into the relationships between live-streaming marketing elements on perceived uncertainty and purchase intention. Contrary to expectations, live-streamer competence (LC) did not significantly reduce perceived uncertainty (PU) (β=-0.085, p=0.096), though it directly enhanced purchase intention (PI) (β=0.260, p<0.001). Similarly, online traffic (OT) showed no significant effect on PU (β=-0.026, p=0.621) but positively influenced PI (β=0.234, p<0.001). Information usefulness (IU) emerged as the most impactful factor, simultaneously reducing PU (β=-0.191, p<0.001) and boosting PI (β=0.232, p<0.001). The product scarcity (PS) results were particularly noteworthy, as they contradicted conventional wisdom by increasing PU (β=0.370, p<0.001) while showing no significant effect on PI (β=-0.019, p=0.673). Finally, the negative relationship between PU and PI (β=-0.099, p=0.016) confirms that uncertainty directly inhibits purchase decisions. These findings suggest that while online traffic (OT) and information usefulness (IU) effectively drive purchases, scarcity tactics may backfire by amplifying consumer perceived uncertainty rather than creating urgency.

This study corroborates several prior findings (Chen & Zhang, 2023; Hernandez et al., 2014; Mannan et al., 2019; Moharana & Pradhan, 2020; Orlowski et al., 2021; Wang et al., 2020; Weathers et al., 2015), which posit that live-streamer competence, online traffic, and information usefulness positively influence purchase intention. However, only information usefulness was found to mitigate perceived uncertainty (Chen & Zhang, 2023; Hernandez et al., 2014; Weathers et al., 2015), whereas product scarcity was observed to increase perceived uncertainty (Chen & Zhang, 2023; Y. Li et al., 2019; Teubner & Graul, 2020).

Conversely, this study diverges from previous research in key aspects: live-streamer competence and online traffic demonstrated no significant effect on perceived uncertainty, and product scarcity similarly exhibited no influence on purchase intention. These discrepancies may stem from variations in research contexts and geographical settings, which shape distinct consumer behaviors in live-streaming commerce. Prior studies were conducted in China (Chen & Zhang, 2023; Li et al., 2019; Ma et al., 2018), the United States (Orlowski et al., 2021; Wang et al., 2017; Teubner & Graul, 2020), Bangladesh (Mannan et al., 2019), and India (Moharana & Pradhan, 2020), whie this study was conducted in Indonesia.

The findings underscore the novel contribution of this research by confirming the direct effects of live-streaming marketing elements, specifically live-streamer competence, online traffic, and information usefulness, on purchase intention, as well as the negative association between product scarcity and perceived uncertainty. Based on the research findings regarding live-streaming shopping, here are some tailored managerial implications for companies and society to enhance the effectiveness of live-streaming strategies:

First, enhance live-streamer competence through selection criteria and training. Choose live-streamers who have demonstrated expertise in the product category and possess strong communication skills. Their competence can drive higher engagement and conversion rates. Also, invest in training programs for live-streamers to improve their product knowledge, presentation skills, and engagement techniques. Competent live-streamers who are knowledgeable and articulate can build consumer trust and positively influence purchase intentions. Second, manage online traffic effectively. While online traffic can enhance social proof and create a sense of urgency, it should be managed to avoid overwhelming viewers. Ensure that the level of interaction and engagement remains high, even with a large audience, to maintain a positive shopping experience. Moreover, implement interactive features such as real-time Q&A, polls, and chat options to keep the crowd engaged and provide immediate feedback. This can help in managing the dynamics of a large audience and enhance the overall shopping experience.

Third, increase information usefulness. Business owners should provide detailed and transparent information about the product, including specifications, benefits, use cases, and potential drawbacks. High information usefulness can help reduce perceived uncertainty and positively influence purchase intentions. Use high-quality visuals, demonstrations, and interactive elements to showcase the product effectively. Clear, detailed demonstrations can help consumers understand the product better and make informed decisions. Fourth, mitigate perceived uncertainty. Address potential sources of uncertainty by providing clear, accurate, and comprehensive information. Ensure that all claims about the product are substantiated and that consumers have access to relevant details to make informed decisions. Offer robust customer support options, including live chat or helplines, to address any queries or concerns consumers may have during the live-streaming event. Reducing uncertainty through effective support can enhance purchase intentions. Fifth, the dissemination of product scarcity information should be avoided. Businesses employing live-streaming strategies frequently emphasize the limited availability of promoted products. However, this approach represents a double-edged sword, as empirical evidence indicates that such practices exacerbate perceived uncertainty among consumers. To optimize live-streaming marketing, focus on enhancing live-streamer competence, managing online traffic, and increasing information usefulness. Also, address perceived uncertainty through clear communication. By implementing these managerial implications, businesses can improve purchase intentions, reduce uncertainty, and create a more engaging and effective live-streaming shopping experience.

4. Conclusions

Based on the analyzed and discussed findings of this study, the following conclusions can be drawn: First, live-streamer competence does not significantly impact perceived uncertainty. This finding suggests that live-streamer competence may not always effectively address perceived uncertainty among consumers. Even a highly competent live-streamer might not have complete or detailed information about every product, especially in dynamic live-streaming scenarios. Second, live-streamer competence has a positive and significant effect on purchase intention. This evidence indicates that competent live-streamers are often perceived as more knowledgeable and trustworthy thus enhancing the likelihood of making a purchase. Third, online traffic does not affect perceived uncertainty. This finding suggests that the presence of a large number of viewers in live-streaming shopping does not contribute to reducing uncertainty. Fourth, online traffic has a positive and significant effect on purchase intention. This evidence indicates that online traffic can enhance the perception that a product is popular and in high demand thus drives purchase intentions. Fifth, information usefulness has a negative and significant effect on perceived uncertainty. High diagnosticity provides clear, detailed, and relevant information about the product, which helps consumers make more informed decisions. This clarity reduces uncertainty and perceived risk. Sixth, information usefulness has a positive and significant effect on purchase intention. This evidence confirms that when consumers can accurately evaluate a product's features, benefits, and potential drawbacks through detailed and relevant information, they are more likely to feel comfortable proceeding with a purchase. Seventh, product scarcity has a positive and significant effect on perceived uncertainty. This finding also indicates that when a product is presented as scarce whether due to limited quantities or high demand consumers may experience a heightened sense of uncertainty risk. Eighth, product scarcity does not significantly affect purchase intention. This finding indicates that consumers tend to prioritize how well the product meets their needs and its overall value rather than the urgency created by scarcity. Ninth,

perceived uncertainty has a negative and significant effect on purchase intention. This evidence explains that consumers generally prefer to avoid risk when making purchasing decisions.

Acknowledgement

This study was funded by the Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) of Universitas Dian Nuswantoro through internal research grant number 076/A.38-04/UDN-09/VII/2024. We sincerely thank LPPM Universitas Dian Nuswantoro for their generous support and funding, which have been crucial to the successful completion of this study. Their commitment to advancing research and supporting academic endeavors is greatly appreciated.

References

Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages. *Journal of Advertising, 40*(3), 19–30. https://doi.org/10.2753/JOA0091-3367400302

Byun, K., Ma, M., Kim, K., & Kang, T. (2021). Buying a new product with inconsistent product reviews from multiple sources: The role of information diagnosticity and advertising. *Journal of Interactive Marketing, 55*, 81–103. https://doi.org/10.1016/j.intmar.2021.01.003

Chang, H. H., & Wu, L. H. (2014). An examination of negative e-WOM adoption: Brand commitment as a moderator. *Decision Support Systems, 59*, 206–218. https://doi.org/10.1016/j.dss.2013.11.008

Chen, C., & Zhang, D. (2023). Understanding consumers' live-streaming shopping from a benefit–risk perspective. *Journal of Services Marketing.* https://doi.org/10.1108/JSM-04-2022-0143

Databoks. (2023). Transaksi e-commerce konsumen usia tua terus meningkat ketimbang Gen Z dan Milenial. *Databoks.* https://databoks.katadata.co.id/teknologi-telekomunikasi/statistik/e3db959da18b8e6/transaksi-e-commerce-konsumen-usia-tua-terus-meningkat-ketimbang-gen-z-dan-milenial

Dimoka, A., Hong, Y., & Pavlou, P. A. (2012). On product uncertainty in online markets: Theory and evidence. *MIS Quarterly, 36*(2), 395–426. https://doi.org/10.2307/41703461

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Fei, M., Tan, H., Peng, X., Wang, Q., & Wang, L. (2021). Promoting or attenuating? An eye-tracking study on the role of social cues in e-commerce livestreaming. *Decision Support Systems, 142*, 113466. https://doi.org/10.1016/j.dss.2020.113466

Gao, X., Xu, X.-Y., Tayyab, S. M. U., & Li, Q. (2021). How the live streaming commerce viewers process the persuasive message: An ELM perspective and the moderating effect of mindfulness. *Electronic Commerce Research and Applications, 49*, 101087. https://doi.org/10.1016/j.elerap.2021.101087

Guo, L., Hu, X., Lu, J., & Ma, L. (2021). Effects of customer trust on engagement in live streaming commerce: Mediating role of swift guanxi. *Internet Research, 31*(5), 1718–1744. https://doi.org/10.1108/INTR-02-2020-0078

Hernandez, J. M. C., Han, X., & Kardes, F. R. (2014). Effects of the perceived diagnosticity of presented attribute and brand name information on sensitivity to missing information. *Journal of Business Research, 67*(5), 874–881. https://doi.org/10.1016/j.jbusres.2013.07.006

Hong, Y. (Kevin), & Pavlou, P. A. (2014). Product fit uncertainty in online markets: Nature, effects, and antecedents. *Information Systems Research, 25*(2), 328–344. https://doi.org/10.1287/isre.2014.0520

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1954). *Communication and persuasion: Psychological studies of opinion change.* American Sociological Review, 19(3), 355.

https://doi.org/10.2307/2087772

Hu, M., & Chaudhry, S. S. (2020). Enhancing consumer engagement in e-commerce live streaming via relational bonds. *Internet Research, 30*(3), 1019–1041. https://doi.org/10.1108/INTR-03-2019-0082

Hulland, J., Baumgartner, H., & Smith, K. M. (2018). Marketing survey research best practices: Evidence and recommendations from a review of JAMS articles. *Journal of the Academy of Marketing Science, 46*(1), 92–108. https://doi.org/10.1007/s11747-017-0532-y

Huwaida, L. A., Yusuf, A., Satria, A. N., Darmawan, M. A., Ammar, M. F., Yanuar, M. W., Hidayanto, A. N., & Yaiprasert, C. (2024). Generation Z and Indonesian social commerce: Unraveling key drivers of their shopping decisions. *Journal of Open Innovation: Technology, Market, and Complexity, 10*(2). https://doi.org/10.1016/j.joitmc.2024.100256

Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems, 44*(2), 544–564. https://doi.org/10.1016/j.dss.2007.07.001

Kock, N. (2018). Minimum sample size estimation in PLS-SEM: An application in tourism and hospitality research. In *Applying partial least squares in tourism and hospitality research* (pp. 1–16). Emerald Group Publishing Ltd. https://doi.org/10.1108/978-1-78756-699-620181001

Kredivo. (2020). Perilaku konsumen e-commerce Indonesia. *Kredivo.* https://kredivocorp.com/wp-content/uploads/2020/08/Kredivo_Katadata_Ecom-Report.pdf

Lee, J.-M., & Kim, H.-J. (2020). Determinants of adoption and continuance intentions toward Internet-only banks. *International Journal of Bank Marketing, 38*(4), 843–865. https://doi.org/10.1108/IJBM-07-2019-0269

Lee, K., Lee, B., & Oh, W. (2015). Thumbs up, sales up? The contingent effect of Facebook likes on sales performance in social commerce. *Journal of Management Information Systems, 32*(4), 109–143. https://doi.org/10.1080/07421222.2015.1138372

Li, C.-Y. (2017). Why do online consumers experience information overload? An extension of communication theory. *Journal of Information Science, 43*(6), 835–851. https://doi.org/10.1177/0165551516670096

Li, Y., Li, X., & Cai, J. (2021). How attachment affects user stickiness on live streaming platforms: A socio-technical approach perspective. *Journal of Retailing and Consumer Services, 60*, 102478. https://doi.org/10.1016/j.jretconser.2021.102478

Li, Y., Wu, R., Li, D., & Fan, H. (2019). Can scarcity of products promote or restrain consumers' word-of-mouth in social networks? The moderating roles of products' social visibility and consumers' self-construal. *Computers in Human Behavior, 95*, 14–23. https://doi.org/10.1016/j.chb.2019.01.013

Lin, Y., Yao, D., & Chen, X. (2021). Happiness begets money: Emotion and engagement in live streaming. *Journal of Marketing Research, 58*(3), 417–438. https://doi.org/10.1177/00222437211002477

Lu, B., & Chen, Z. (2021). Live streaming commerce and consumers' purchase intention: An uncertainty reduction perspective. *Information & Management, 58*(7), 103509. https://doi.org/10.1016/j.im.2021.103509

Ma, Y. (2021). To shop or not: Understanding Chinese consumers' live-stream shopping intentions from the perspectives of uses and gratifications, perceived network size, perceptions of digital celebrities, and shopping orientations. *Telematics and Informatics, 59*, 101562. https://doi.org/10.1016/j.tele.2021.101562

Mannan, M., Ahamed, R., & Zaman, S. B. (2019). Consumers' willingness to purchase online mental health services. *Journal of Services Marketing, 33*(5), 557–571. https://doi.org/10.1108/JSM-05-2018-0163

Moharana, T. R., & Pradhan, D. (2020). Shopping value and patronage: When satisfaction and crowding count. *Marketing Intelligence & Planning, 38*(2), 137–150. https://doi.org/10.1108/MIP-07-2018-0264

Noone, B. M., & Mattila, A. S. (2009). Consumer reaction to crowding for extended service encounters. *Managing Service Quality: An International Journal, 19*(1), 31–41. https://doi.org/10.1108/09604520910926791

Orlowski, M., Bufquin, D., & Nalley, M. E. (2021). The influence of social perceptions on restaurant employee work engagement and extra-role customer service behavior: A moderated mediation model. *Cornell Hospitality Quarterly, 62*(2), 261–275. https://doi.org/10.1177/1938965520910119

Park, S., Rabinovich, E., Tang, C. S., Yin, R., & Yu, J. J. (2020). Technical note: Should an online seller post inventory scarcity messages? *Decision Sciences, 51*(5), 1288–1308. https://doi.org/10.1111/deci.12402

Populix. (2022). An outlook of Indonesia's quick commerce 2022. *Populix.* https://info.populix.co/articles/en/report/outlook-of-indonesia-quick-commerce/

Rakuten Insight. (2024). Leading reasons for not participating in live commerce or live shopping events in Indonesia as of May 2024. *Rakuten Insight.* https://www.statista.com/statistics/1493470/indonesia-reasons-for-not-participating-in-live-commerce-or-live-shopping-events/

Roy, R., & Sharma, P. (2015). Scarcity appeal in advertising: Exploring the moderating roles of need for uniqueness and message framing. *Journal of Advertising, 44*(4), 349–359. https://doi.org/10.1080/00913367.2015.1018459

Saffanah, L., Handayani, P. W., & Sunarso, F. P. (2023). Actual purchases on Instagram Live Shopping: The influence of live shopping engagement and information technology affordance. *Asia Pacific Management Review, 28*(2), 204–214. https://doi.org/10.1016/j.apmrv.2022.09.002

Sun, Y., Shao, X., Li, X., Guo, Y., & Nie, K. (2019). How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electronic Commerce Research and Applications, 37*, 100886. https://doi.org/10.1016/j.elerap.2019.100886

Statista. (2023). Main challenges to online shopping in Indonesia as of January 2023. *Statista.* https://www.statista.com/statistics/1427731/indonesia-challenges-to-online-shopping/

Teubner, T., & Graul, A. (2020). Only one room left! How scarcity cues affect booking intentions on hospitality platforms. *Electronic Commerce Research and Applications, 39*, 100910. https://doi.org/10.1016/j.elerap.2019.100910

Tong, X., Chen, Y., Zhou, S., & Yang, S. (2022). How background visual complexity influences purchase intention in live streaming: The mediating role of emotion and the moderating role of gender. *Journal of Retailing and Consumer Services, 67*, 103031. https://doi.org/10.1016/j.jretconser.2022.103031

Wang, X., Keh, H. T., & Yan, L. (2020). Customer perceptions of frontline employees' extra-role helping behaviors. *Journal of Services Marketing, 34*(6), 869–883. https://doi.org/10.1108/JSM-08-2019-0298

Weathers, D., Swain, S. D., & Grover, V. (2015). Can online product reviews be more helpful? Examining characteristics of information content by product type. *Decision Support Systems, 79*, 12–23. https://doi.org/10.1016/j.dss.2015.07.009

Wongkitrungrueng, A., Dehouche, N., & Assarut, N. (2020). Live streaming commerce from the sellers' perspective: Implications for online relationship marketing. *Journal of Marketing Management, 36*(5–6), 488–518. https://doi.org/10.1080/0267257X.2020.1748895

Yi, C., Jiang, Z. (Jack), & Benbasat, I. (2017). Designing for diagnosticity and serendipity: An investigation of social product-search mechanisms. *Information Systems Research, 28*(2), 413–429. https://doi.org/10.1287/isre.2017.0695

Zhang, M., Sun, L., Qin, F., & Wang, G. A. (2021a). E-service quality on live streaming platforms: Swift guanxi perspective. *Journal of Services Marketing, 35*(3), 312–324. https://doi.org/10.1108/JSM-01-2020-0009

Zhang, M., Sun, L., Qin, F., & Wang, G. A. (2021b). E-service quality on live streaming platforms:

Swift guanxi perspective. *Journal of Services Marketing*, *35*(3), 312–324. https://doi.org/10.1108/JSM-01-2020-0009

Zhang, X., Cheng, X., & Huang, X. (2023). "Oh, my God, buy it!" Investigating impulse buying behavior in live streaming commerce. *International Journal of Human–Computer Interaction*, *39*(12), 2436–2449. https://doi.org/10.1080/10447318.2022.2076773

Zhu, D. H., Chang, Y. P., & Chang, A. (2015). Effects of free gifts with purchase on online purchase satisfaction. *Internet Research*, *25*(5), 690–706. https://doi.org/10.1108/IntR-12-2013-0257