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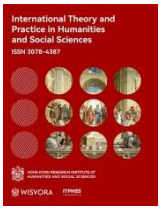

Investigation of China's Customers' Purchase Patterns on Agricultural Products via Live-streaming E-commerce in China

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Abstract

Purpose: This study investigates the relationship among Chinese consumers' preferred consumption values (i.e., functional, social, emotional, epistemic, indulgence value, and food safety consciousness), attitude, and purchase intention in the context of agricultural products live-streaming e-commerce.

Approach/Methodology/Design: The study uses the value-attitude-behavior (VAB) model, incorporating the consumption values theory to formulate hypotheses. A questionnaire survey was conducted with 450 Chinese agricultural product customers on TikTok Live. Structural Equation Modeling (SEM) using SmartPLS 4.1 was employed for data analysis.

Findings: Consumption values, except for social value, significantly influenced consumers' attitudes toward agricultural product shopping via live-streaming e-commerce, with emotional value being the strongest predictor. Attitudes mediated the relationship between these values (excluding social value) and purchase intention. Streamers' expertise moderated the impact of indulgence value on attitudes, while online shopping self-efficacy moderated the relationship between attitudes and purchase intention.

Practical Implications: The findings offer valuable insights for agricultural product businesses and practitioners, helping them optimize their strategies for expanding sales via live-streaming e-commerce.

Originality/value: This study provides a novel exploration of the impact of various consumption values on attitudes and purchase intention within live-streaming e-commerce, offering theoretical contributions and practical guidance specifically for agricultural products.

1. Introduction

Live-streaming e-commerce combines e-commerce and streaming technology, enabling real-time interaction (Ahmad and Akbar, 2021; Zhang et al., 2022), authentic product displays (Li et al., 2024), and immersive digital experiences (Song et al., 2022). Streamers use their expertise to attract viewers and boost sales (Liao et al., 2023), reshaping consumer habits and creating new promotional channels (Wongkitrungrueng & Assarut, 2020). This trend has expanded into agriculture, enhancing product sales (Zeng et al., 2022). During COVID-19, it addressed unsold produce issues and continues to drive growth (Zeng et al., 2022; Chen et al., 2023), especially in China's durian market, where Taobao Live saw sales soar (Chinadaily, 2023). TikTok Live also

facilitated billions of agricultural orders (The Beijing News, 2023), reflecting consumers' increasing preference for buying agricultural products through this platform.

However, not all sellers succeed in live-streaming e-commerce (Tan, 2024), highlighting the need to identify success factors. Many agricultural enterprises lack effective marketing tools and understanding of online consumer behavior (Zhao et al., 2017; Tan, 2024). Research has identified key factors influencing purchase intentions, including service quality (Dong et al., 2022), product familiarity (Yu and Zhang, 2022), promotions (Zheng et al., 2023), and live room interactions (Tan, 2024). Studies have also explored perceived usefulness, social presence (Su, 2019), information quality (Dong et al., 2022), emotional mediation (Zhou et al., 2022), and perceived value (Wu et al., 2023). Despite this, gaps remain in understanding specific consumption value attributes in agricultural live-streaming. This study addresses the gap by using the Value-Attitude-Behavior Model to explore factors influencing Chinese consumers' attitudes and purchase intentions for agricultural products, considering the moderating roles of streamers' expertise and consumers' self-efficacy.

To be specific, the theoretical framework for this study integrates the theory of consumption value and the Value-Attitude-Behavior (VAB) model. The theory of consumption value posits that consumer purchasing behavior is influenced by multiple dimensions of value, including functional, social, emotional, cognitive, and conditional value (Sheth et al., 1991). This theory has been widely applied in understanding consumer adoption of live-streaming e-commerce and agricultural product purchases (Wongkitrungrueng et al., 2020; Yu and Zheng, 2022; Lin et al., 2010; Wang et al., 2018). The VAB model, developed by Homer and Kahle (1988), emphasizes the role of values in shaping attitudes and subsequent behaviors. It has been utilized in various contexts, including agricultural products and online shopping (Fulton et al., 1996; Teng et al. 2014; Govaerts and Olsen, 2023; Zhang and Dong, 2020; Zhao et al., 2017). By integrating these two theoretical perspectives, this study aims to construct a comprehensive framework to examine and predict consumers' consumption values, attitudes, and purchase intentions in the context of agricultural products live-streaming e-commerce in China. This integrated approach allows for a multidimensional analysis of consumer behavior (Williams and Soutar, 2009) while accounting for the complex interplay between values, attitudes, and behaviors (Vaske and Donnelly, 1999). Recent expansions of the VAB model, which incorporate additional variables and integrate other theories, have demonstrated improved predictive power (Handriana et al., 2021; Kim et al., 2021; Liu et al., 2021), further supporting the rationale for this integrated theoretical framework.

2. Hypotheses development

2.1 Functional Value

Functional value refers to the benefits consumers perceive an alternative could provide in terms of functional, utilitarian, or physical performance (Kaur et al., 2018). Sheth et al. (1991) found that functional value is the main driver for consumer shopping decisions. When consumers perceive beneficial functional value in products and sales channels during the awareness and purchase process, it fosters a positive consumption attitude (Chang and Geng, 2022; Mason et al., 2023). A key advantage of live-streaming e-commerce is that it allows consumers to thoroughly assess a product's functional, utilitarian, and physical performance benefits before purchasing through real-time displays and streamer introductions (Lin and Chen, 2019).In the study of

agricultural products live-streaming e-commerce, Tan (2024) pointed out that consumers can obtain information or price discounts by interacting with the live-streaming room, forming functional value. This study posits that live-streaming e-commerce for agricultural products conveys functional value through vivid displays, explanations of practicality, real-time answering of questions, showcasing certification reports, and providing value-added services. This helps cultivate a positive attitude among consumers. Therefore, the following hypothesis is proposed:

H1: Functional value is positively related to customers' attitudes toward agricultural products shopping via live-streaming e-commerce.

2.2 Social Value

Social value refers to the utility consumers derive from associating an alternative with specific social groups (Sheth et al., 1991). Live-streaming e-commerce facilitates the creation of social groups, enabling users to interact with sellers, streamers, and other customers (Lin and Chen, 2019). Tan (2024) noted that live-streaming e-commerce of agricultural products can provide consumers with significant social value affecting customer behavior. For instance, live-streaming purchases of rare and high-end agricultural products can reflect social status, while buying organic products represents fulfilling social responsibility. Therefore, the hypothesis is formulated as:

H2: Social Value is positively related to customers' attitudes toward agricultural products shopping via live-streaming e-commerce.

2.3 Emotional Value

Emotional value stems from options that evoke crucial feelings in purchase decisions (Khan and Mohsin, 2017). In live-stream e-commerce, consumer engagement aims for personal emotional fulfilment, notably relaxation (Wang et al., 2020). Streamers' emotional connections significantly shape consumer attitudes toward services and products (Gao, 2021). Engaging activities impact perceived value and usage attitudes (Cao et al., 2022), fostering a deeper bond between streamers and consumers (Hilvert-Bruce et al., 2018). In agricultural products live-streaming e-commerce, these tactics are employed to evoke emotional responses from consumers, enhancing their positive experiences and cultivating stronger attitude trends. Therefore, the hypothesis is formulated as:

H3: Emotional value is positively related to customers' attitudes toward agricultural products shopping via live-streaming e-commerce.

2.4 Epistemic Value

Epistemic value encompasses the perceived benefit gained from an alternative's ability to spark curiosity, offer novelty, and fulfil the quest for knowledge (Sheth et al., 1991). Research indicates a strong positive correlation between epistemic value and various consumer reactions (Mason et al., 2023). Ghufran et al. (2022) discovered that epistemic value contributes to a favorable consumer attitude. Karjaluoto et al. (2021) noted that the epistemic value dimension shapes consumer attitudes and behaviors regarding the adoption of new mobile technology services. In the agricultural industry, consumers often seek to understand product origins, cultivation

processes, and related information. Through live-streaming e-commerce, producers can convey detailed product information, increasing consumers' epistemic value. Consumers also tend to interact with streamers, ask questions, and learn more about product backgrounds, further enhancing the epistemic value experience. Therefore, we believe these unique cognitive value experiences will positively influence consumer attitudes. Therefore, the hypothesis is formulated as:

H4: Epistemic Value is positively related to customers' attitudes toward agricultural products shopping via live-streaming e-commerce.

2.5 Conditional Value

Conditional value is defined as the propensity to change behavior based on specific circumstances (Sheth et al., 1991). It enhances consumption value under particular conditions and represents the most ambiguous dimension within consumption value theory. To better comprehend conditional value within the context of this study, we conceptualized it based on individual-level cultural values and safety concerns of consumers (i.e., indulgence value and food safety consciousness). This conceptualization is supported by Hofstede's cultural dimensions theory and Schwartz's Theory of Basic Human Values.

Indulgence Value

Hofstede (2011) and Minkov (2007) identified the indulgence versus restraint dimension as a pivotal element influencing consumer behavior. This dimension reflects consumers' pursuit of happiness and gratification, which shapes their decision-making process (Bathaee, 2014). Individuals who embrace indulgence value are inclined to savor life's pleasures and engage in enjoyable activities (Hofstede, 2011). Research has established that indulgence value is a critical driver of consumer behavior intentions (Heydari, 2021). Chinese consumers have become more materialistic, embracing the concept of purchasing for hedonic and indulgence benefits (Sun et al., 2016; Wu and Yang, 2018). Moreover, Wen et al. (2018) found that consumers' indulgence value positively affects their online attitude and purchase intention.

Consumers with high indulgence values may be swayed by positive reviews and hedonistic feelings, influencing their attitude toward making spontaneous purchases. This aligns with the nature of on-the-spot buying prevalent in agricultural products live-streaming e-commerce. For example, when streamers promote fresh strawberries via live-streaming, praising their sweetness and juiciness while demonstrating their enticing appearance, and existing buyers compliment the strawberries' freshness and quality, it may drive consumers with high indulgence values to develop positive attitudes toward shopping via agricultural products live-streaming e-commerce. Hence, we formulate the following hypothesis:

H5a: Indulgence value is positively related to customers' attitudes toward agricultural product shopping via live-streaming e-commerce.

Food Safety Consciousness

Security value, defined by Schwartz et al. (2012) as "personal safety in one's immediate environment" and "societal stability," is one of the basic human values. As a dimension of consumers' perceived value, security is particularly important (Bharwani and Mathews, 2021). In the field of agricultural product consumption, multiple studies have shown that food safety is a

crucial factor influencing consumer attitudes and purchase intentions (Hsu et al., 2016; Tan et al., 2022; Zhao et al., 2017). Food safety is the main reason Chinese consumers are willing to pay a premium for organic agricultural products (Li et al., 2019).

Due to the highly perishable nature of agricultural products and their generally short shelf lives, food safety becomes a major concern for consumers when purchasing these items online (Zhao et al., 2017). In live-streaming e-commerce sales of agricultural products, consumers can directly obtain product information through interactions with the streamer, especially regarding the freshness and quality of the products. This direct addressing and demonstration of food safety concerns may drive consumers to develop positive attitudes toward shopping via agricultural products live-streaming e-commerce. Therefore, we propose the following hypothesis:

H5b: Food safety consciousness is positively related to customers' attitudes toward agricultural product shopping via live-streaming e-commerce.

2.6 Attitude and Purchase Intentions

Consumer behavior heavily relies on attitudes, defined as a learned inclination to consistently react favorably or unfavorably towards a specific entity (Ajzen and Fishbein, 1975). Many studies confirm that consumer's attitudes drive their purchase intentions in live-streaming e-commerce (Liu et al., 2024; Tiwari et al., 2023; Yu and Zheng, 2022). In the agricultural products field, Fahlevi et al. (2023) investigated China's consumer attitudes and purchasing intentions towards green agricultural products and Karim et al. (2021) verified attitude as a key factor in online purchase intention for fresh agricultural products. On the other hand, the value-attitude-behavior model posits that consumer attitudes toward behavior drive positive behavioral intentions (Homer and Kahle, 1988). In light of this framework logic and empirical evidence, it's evident that specific attitudes toward shopping mediums stand as pivotal drivers of actual shopping behavior. In other words, when consumers with positive attitudes toward agricultural products shopping via live-streaming e-commerce, they are more inclined to generate purchase intention of agricultural products via live-streaming e-commerce. Thus, the hypothesis follows:

H6: Customers' attitudes toward agricultural products shopping via live-streaming e-commerce is positively related to their purchase intention of agricultural products via live-streaming e-commerce.

2.7 Attitude as Mediator

As mentioned in the previous section, the value-attitude-behavior model suggests that values come before attitudes and consequently influence particular attitudes, which indirectly affect how consumers behave (Homer and Kahle, 1988). Attitudes serve as pivotal mediators in connecting consumers' perceived value with their purchase intention (Mainardes et al., 2017). In live-streaming e-commerce, Attitudes also evidenced that key mediators in purchase intention research (Peng et al., 2023; Su, 2019). Based on theoretical foundations and empirical evidence, in the context of this study, attitude represents a customer's emotional assessment of agricultural products and agricultural products live-streaming e-commerce, influenced by a multitude of factors, including their consumption values. Subsequently, these attitudes wield significant influence over a customer's purchase intention toward agricultural products via live-streaming e-commerce. Therefore, the hypothesis follows:

H7a-f: Consumers customers' attitudes toward agricultural products shopping via live-streaming e-commerce mediate the relationship between customers' consumption values [i.e., functional value(H7a), social value(H7b), emotional value (H7c), epistemic value (H7d), indulgence value (H7e) and food safety consciousness(H7f)] and purchase intention of agricultural products via live-streaming e-commerce.

2.8 The Moderating Role of Streamers' Expertise

The proficiency of live-streaming streamers' expertise is a pivotal driver compelling consumer to engage in live-streaming e-commerce (Al-Emadi and Ben, 2020). Streamers who have high-level expertise shape customer attitudes by furnishing comprehensive product details, addressing inquiries regarding product utility, and suggesting well-suited products, thereby economizing consumers' time and expenses (Deshbhag and Mohan, 2020). The streamers' expertise denotes their adeptness in delivering accurate insights through their demonstrated skills, knowledge, or capabilities (Liao et al., 2023). A streamer with substantial expertise can augment consumers' positive attitudes toward the streamer, brand, and product (Trivedi and Sama, 2020). This proficiency holds a moderating influence, fostering consumer psychology factors within the live-streaming e-commerce realm (Liao et al., 2023). Logically, the greater the streamers' expertise, customers are to develop a more positive relationship between consumption value and attitude. Therefore, the hypothesis is formulated as:

H8a-f: Streamers' expertise moderates the relationship between customers' consumption values [i.e., functional value(H8a), social value(H8b), emotional value (H8c), epistemic value (H8d), indulgence value (H8e) and indulgence value (H8f)] and their attitudes toward agricultural products shopping via live-streaming e-commerce and purchase intention of agricultural products via live-streaming e-commerce.

2.9 The Moderating Role of online shopping self-efficacy

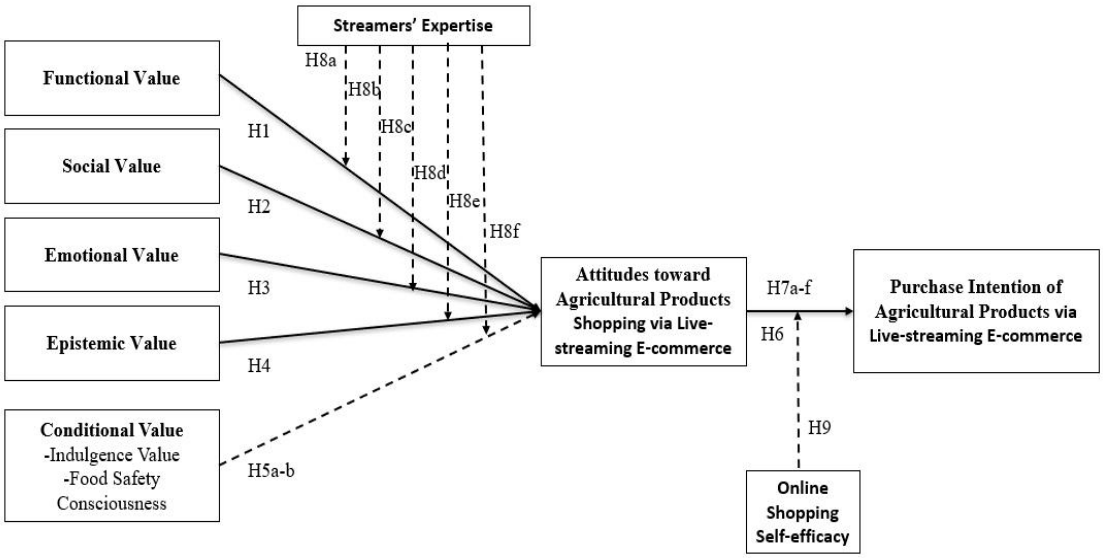
Online shopping self-efficacy represents individuals' confidence in engaging in e-commerce activities (Dash and Saji, 2008). This trait serves as a moderator of online shopping behavior, shaping perceptions related to planning and executing e-commerce actions (Dash and Saji, 2008). While some individuals excel in this domain, adeptly navigating tasks with confidence, others may not feel as capable (Compeau and Higgins, 1995). Recognizing the significance of online shopping self-efficacy is crucial, given its influence on consumers' intentions within the digital marketplace (Hsu and Chiu, 2004). High level online shopping self-efficacy has been shown to impact decision-making quality and satisfaction with online purchases (Zha et al., 2013). Confidence in online shopping is pivotal in enhancing satisfaction and facilitating decision-making processes online (Yi and Gong, 2008). This study aligns with Yi and Gong's proposition, seeking to investigate how online shopping self-efficacy moderates across different contexts, specifically in live-streaming e-commerce for agricultural products. Specifically, customers with high levels of online shopping self-efficacy are more inclined towards purchase intention when shopping for agricultural products via live-streaming e-commerce compared to individuals with lower levels of online shopping self-efficacy. Therefore, the formulated hypothesis is as follows:

H9: Customers' online shopping self-efficacy moderates the relationship between their attitudes toward agricultural products shopping via live-streaming e-commerce and purchase intention of

agricultural products via live-streaming e-commerce.

Figure 1 illustrates the conceptual framework examining the relationship between five consumption values (six independent variables) and purchase intention of agricultural products via live-streaming e-commerce, mediated by shopping attitudes and moderated by streamers' expertise and online shopping self-efficacy.

Figure 1. A conceptual model



3. Research method and data analysis

3.1 Instrument design

A comprehensive questionnaire was developed based on an extensive literature review and tailored to agricultural products live-streaming e-commerce. The questionnaire, consisting of 44 items across 10 constructs, adapted established scales (see Table 1). Functional value and purchase intention (Yu & Zheng, 2022), social value (Omigie et al., 2017), emotional and epistemic values (Chakraborty & Paul, 2022), indulgence value (Wen et al., 2018), food safety consciousness (Zhao et al., 2017), attitudes toward agricultural products shopping (Yeo et al., 2017), streamers' expertise (Liao et al., 2023), and online shopping self-efficacy (Dash & Saji, 2008) were included. Responses were measured on a five-point Likert scale. The questionnaire covered a screening question, demographics, and measurement of consumption values, attitudes, streamers' expertise, and purchase intention. TikTok Live was chosen as the context due to its popularity and initiatives supporting agricultural sales (Tan, 2024; Beijing News, 2023).

Table 1. Measurement item

Functional Value (FUV) (Yu and Zheng, 2021)	
FUV1	The TikTok Live streamer describes the agricultural products in detail.
FUV2	The TikTok streamer shows agricultural products in detail.
FUV3	I can clearly understand agricultural products via TikTok.
FUV4	The TikTok streamer uses professional explanations of agricultural products.
FUV5	The TikTok streamer offers certification letters for their agricultural products.

FUV6 The TikTok streamer promises to return agricultural products with service and experience problems.
FUV7 I can see the difference among agricultural products on TikTok Live.
FUV8 The TikTok Live streamer describes the uniqueness of each agricultural product.
FUV9 The TikTok Live streamer compares the differences between similar agricultural products.

Social Value (SOV) (Omigie et al.,2017)

SOV1 I think that purchasing agricultural products via TikTok Live will show my better social image to others.
SOV2 I think that purchasing agricultural products via TikTok Live makes me acceptable among other customers.
SOV3 I think that purchasing agricultural products via TikTok Live increases my social relationships with family, friends, groups, associations, and so on.

Emotional Value (EMV) (Chakraborty and Paul, 2022)

EMV1 I feel relaxed while purchasing agricultural products via TikTok Live.
EMV2 I enjoy purchasing agricultural products via TikTok Live.
EMV3 Purchasing agricultural products via TikTok Live gives me pleasure.
EMV4 Purchasing agricultural products via TikTok Live is interesting to me.
EMV5 The TikTok Live streamer emotionally engaged with the audience during the live streaming.
EMV6 The interaction between the TikTok Live streamer and the audience resonates during the live streaming.

Epistemic Value (EPV) (Chakraborty and Paul, 2022)

EPV1 I am fascinated by purchasing agricultural products via TikTok Live.
EPV2 I am curious about people who purchase agricultural products via TikTok Live.
EPV3 I am interested in seeking agricultural product information via TikTok Live.
EPV4 I feel using TikTok Live helps me to acquire knowledge about agricultural products.

Indulgence Value (IND) (Wen et al., 2018)

IND1 People should be happy in everyday life.
IND2 People should have fun.
IND3 People should have freedom.

Food Safety Consciousness (FSC) (Zhao et al., 2017)

FSC1 When purchasing agricultural products via live-streaming e-commerce, the quality and safety of food nowadays concern me.
FSC2 When purchasing agricultural products via live-streaming e-commerce, I'm very particular about the quality and safety of agricultural products which I intend to consume.

Attitudes toward Agricultural Products Shopping via Live-streaming E-commerce (ATT) (Yeo et al., 2017)

ATT1 Purchasing agricultural products via TikTok Live is wise.
ATT2 Purchasing agricultural products via TikTok Live is good.
ATT3 Purchasing agricultural products via TikTok Live is sensible.
ATT4 Purchasing agricultural products via TikTok Live is rewarding.

Streamers' Expertise (SE) (Liao et al., 2023)

SE1 The streamer of sold agricultural products via TikTok Live is an expert.

SE2	The streamer of sold agricultural products via TikTok Live is experienced.
SE3	The streamer of sold agricultural products via TikTok Live is knowledgeable.
SE4	The streamer of sold agricultural products via TikTok Live is qualified.
SE5	The streamer of sold agricultural products via TikTok Live is skilled.
Online Shopping Self-efficacy (OSS) (Dash and Saji, 2008)	
OSS1	I am confident about purchasing agricultural products via TikTok Live if there are clear instructions.
OSS2	I am confident about agricultural products via TikTok Live even if there is no one around to show me how to use it.
OSS3	I am confident about agricultural products via TikTok Live even if I have never experienced the same before.
OSS4	I am confident about agricultural products via TikTok Live even if I have just seen someone using it before trying it myself.
OSS5	I am confident about purchasing agricultural products via TikTok Live if there are online help functions for assistance.
Purchase Intention of Agricultural Products via Live-streaming E-commerce (PI) (Yu and Zheng, 2022)	
PI1	The agricultural products on TikTok Live are worth buying.
PI2	I want to try to purchase agricultural products via TikTok Live.
PI3	I intend to purchase agricultural products via TikTok Live when I need.

3.2 Sample and data collection

A purposive sampling method was employed to recruit agricultural products live-streaming e-commerce consumers from China as our study participants. This paper's sample data was collected from China's adult customers using a structured online questionnaire administered via Wenjuanxing, which is a widely recognized online survey platform known for its efficiency and cost-effectiveness in recruiting a large number of participants (Tan, 2024). To reach respondents who have purchased agricultural products on TikTok Live, the researcher will identify potential respondents by commenting on TikTok Live streams related to agricultural products from January to March 2024. The researcher will sincerely invite those interested consumers to participate in this study's online survey. For consumers who express interest, the researcher will privately send them the Wenjuanxing questionnaire link or QR code. All participants will have the opportunity to receive a small cash reward as thanks for their support and cooperation.

To ensure that respondents met our criteria for participation, respondents must answer three pre-screen questions: 'Have you watched agricultural products live-streaming e-commerce on TikTok Live?', 'Could you please tell us the name of the watch streamer?', and 'Purchase any agricultural products via TikTok Live?'. Only respondents who meet the criteria can fill in the questionnaire. Following an Eleven-week data collection period, this left us with 450 valid responses, and Table 2 outlines the sample's demographic characteristics.

Table 2. Demographic Profile of 450 Survey Respondents

Items	Frequency (N=450)	Percent (%)
Age		
18~30	198	44.0
31~42	137	30.4

43~55	109	24.2
>55	6	1.3
Gender		
Male	228	50.7
Female	222	49.3
Education level		
Doctorate	12	2.7
Master's degree	87	19.3
Bachelor's degree	263	58.4
Other	88	19.6
Hours spend on TikTok Live (per day)		
Less than 1 hours	31	6.9
2-3 hours	89	19.8
3-4 hours	239	53.1
5-6 hours	67	14.9
More than 4 hours	24	5.3

3.3 Data analysis

This study employed SmartPLS 4.1, utilizing the partial least squares (PLS) modelling technique for statistical and data analysis. PLS does not rely on the assumption of normality, making it suitable for survey data, which is typically non-normally distributed (Ringle et al., 2022). Additionally, we applied the bootstrapping technique with a substantial number of iterations (N = 5,000) using a component-based approach to rigorously test all proposed hypotheses. During this process, our primary focus was to examine the path coefficients and determine their statistical significance.

Since the data was collected from a single source, we thoroughly assessed for Common Method Bias. We conducted a comprehensive collinearity test following the methodologies recommended by Kock and Lynn (2012) and Kock (2015). All variables were regressed against a common variable, with a VIF (Variance Inflation Factor) threshold set at ≤ 3.3. Our analysis revealed VIF values below 3.3 (reference to Table 3), confirming that single-source bias is not a significant concern in our dataset.

Table 3. Full Collinearity Testing

FUV	SOV	EMV	EPV	IND	FSC	ATT	SE	OSS
1.493	1.573	1.553	1.483	1.503	1.574	1.224	1.358	1.221

Note: FUV= Functional Value, SOV= Social Value, EMV= Emotional Value, EPV= Epistemic Value, IND= Indulgence Value, FSC= Food Safety Consciousness, ATT= Attitudes toward Agricultural Products Shopping via Live-streaming E-commerce, SE= Streamers' Expertise, OSS= Online Shopping Self-efficacy

Measurement Model

In this study, we adhered to the two-step approach proposed by Anderson and Gerbing (1988) to validate the developed model. Initially, we rigorously examined the measurement model, assessing the instruments' validity and reliability following the criteria outlined by Hair et al.

(2022) and Ramayah et al. (2018). Subsequently, we analyzed the structural model to assess and validate the formulated hypotheses.

For the measurement model evaluation, we scrutinized the loadings, average variance extracted (AVE), and composite reliability (CR). The ideal values are loadings ≥0.5, AVE ≥ 0.5, and CR ≥ 0.7. As shown in Table 4, the AVE values exceeded 0.5, and CR of all constructs were above 0.7. The loadings were acceptable, ranging from 0.781 to 0.922, all above the 0.5 threshold (Hair et al., 2022).

In the second step, this research evaluated discriminant validity using the HTMT criterion proposed by Henseler et al. (2015) and revised by Franke and Sarstedt (2019). HTMT values should be ≤ 0.85 for a stringent criterion or ≤ 0.90 for a lenient criterion. As depicted in Table 5, all HTMT values were below the stringent threshold of ≤ 0.85, indicating that respondents clearly distinguished all constructs.

Table 4. Measurement Model for the Constructs

Constructs	Items	Loadings	CR	AVE
Functional Value	FUV1	0.800	0.938	0.627
	FUV2	0.781		
	FUV3	0.785		
	FUV4	0.811		
	FUV5	0.799		
	FUV6	0.795		
	FUV7	0.789		
	FUV8	0.783		
	FUV9	0.783		
Social Value	SOV1	0.857	0.891	0.732
	SOV2	0.859		
	SOV3	0.850		
Emotional Value	EMV1	0.811	0.919	0.654
	EMV2	0.809		
	EMV3	0.844		
	EMV4	0.791		
	EMV5	0.791		
	EMV6	0.806		
Epistemic Value	EPV1	0.823	0.901	0.695
	EPV2	0.822		
	EPV3	0.838		
	EPV4	0.852		

Indulgence Value	IND1	0.871	0.890	0.729
	IND2	0.865		
	IND3	0.825		
Food Safety Consciousness	FSC1	0.922		
	FSC2	0.870		
Attitudes toward Agricultural Products Shopping via Live-streaming E-commerce	ATT1	0.841	0.891	0.803
	ATT2	0.826		
	ATT3	0.830		
	ATT4	0.818		
Streamers' Expertise	SE1	0.812	0.902	0.649
	SE2	0.816		
	SE3	0.794		
	SE4	0.806		
	SE5	0.801		
Online Shopping Self-efficacy	OSS1	0.839	0.923	0.706
	OSS2	0.832		
	OSS3	0.844		
	OSS4	0.834		
	OSS5	0.851		
Purchase Intention of Agricultural Products via Live-streaming E-commerce	PI1	0.849	0.883	0.716
	PI2	0.845		
	PI3	0.844		

Table 5. Discriminant Validity (HTMT)

	ATT	EMV	EPV	FSC	FUV	IND	OSE	PI	SE	SOV
ATT										
EMV	0.447									
EPV	0.458	0.474								
FSC	0.475	0.469	0.446							
FUV	0.434	0.427	0.438	0.496						
IND	0.464	0.459	0.434	0.534	0.435					
OSE	0.471	0.452	0.490	0.453	0.405	0.457				
PI	0.401	0.466	0.336	0.350	0.413	0.466	0.438			
SE	0.393	0.382	0.408	0.428	0.375	0.385	0.431	0.390		
SOV	0.447	0.431	0.447	0.532	0.459	0.493	0.419	0.399	0.456	

Structural Model

Streukens and Leroi-Werelds (2016) have observed considerable variations in the number of

bootstrap samples utilized in PLS-SEM applications, highlighting the lack of definitive guidelines for determining the minimum required number. Wilcox (2022) proposed that at least 2,000 bootstrap samples may be necessary for a robust analysis. In our study, we reported the path coefficients, the standard errors, t-values and p-values for the structural model using 5,000 bootstrap resamples for hypothesis testing (see Tables 6, 7, and 8, and Figure 4).

The adjusted coefficient of determination value (R^2) represents the proportion of variance accounted for in a given model. The result shows attitudes toward agricultural products shopping via Live-streaming e-commerce (R^2 =0.312) and purchase intention of agricultural products via live-streaming e-commerce (R^2 =0.209) indicating that the structural model represents a good value for predictive accuracy in behavioral research (Hair et al., 2022). In addition to assessing the magnitude of the R^2 value as a criterion for predictive accuracy, researchers also frequently examine Stone-Geisser's Q^2 value (Stone, 1974; Geisser, 1974) as a criterion for predicting correlation. By using the blindfolding procedure, the results show that the Q^2 values for attitudes toward agricultural products shopping via live-streaming e-commerce (Q^2 =0.286) and purchase intention of agricultural products via live-streaming e-commerce (Q^2 =0.213) are greater than zero which indicates the structural model's predictive relevance.

Table 6 presents the results of all direct effects in this study, indicating that functional value (β=0.112, p=0.015), emotional value (β=0.130, p=0.010), epistemic value (β=0.118, p=0.013), indulgence value (β=0.162, p=0.000) and food safety consciousness (β=0.121, p=0.011) all had significant effects on customers' attitudes toward agricultural products shopping via Live-streaming e-commerce, while only

social value (β=0.054, p=0.275) is nonsignificant effects on customers' attitudes toward agricultural products shopping via Live-streaming e-commerce. Furthermore, attitudes toward agricultural products shopping via Live-streaming e-commerce (β=0.183, p=0.000) significantly influenced customers' purchase intention of agricultural products via live-streaming e-commerce. As a result, hypotheses H1, H3, H4, H5a, H5b and H6 were supported and H2 is non-supported.

Table 6. Hypothesis Testing Direct Effects

Hypothesis	**Path coefficient**	**STDEV**	**t-value**	**p-values**	**Results**
H1: FUV → ATT	0.112	0.046	2.436	0.015*	Supported
H2: SOV → ATT	0.054	0.049	1.091	0.275ns	Non-Supported
H3: EMV → ATT	0.130	0.050	2.578	0.010*	Supported
H4: EPV → ATT	0.118	0.047	2.488	0.013*	Supported
H5a: IND → ATT	0.118	0.048	2.452	0.014*	Supported
H5b: FSC → ATT	0.121	0.048	2.532	0.011*	Supported
H6: ATT → PI	0.183	0.046	3.988	0.000***	Supported

Note (s): *p<0.05; **p<0.01; ***p<0.001; ns=nonsignificant at .05 level
FUV= Functional Value, SOV= Social Value, EMV= Emotional Value, EPV= Epistemic Value, IND= Indulgence Value, FSC= Food Safety Consciousness, ATT= Attitudes toward Agricultural Products Shopping via Live-streaming E-commerce, SE= Streamers' Expertise, OSS= Online Shopping Self-efficacy, PI = Purchase Intention of Agricultural Products via Live-streaming E-commerce

Assessment of Mediating Effects

Table 7 shows the hypotheses testing of mediating effects results which shows customers' attitudes toward agricultural products shopping via live-streaming e-commerce as playing a

significant mediating role in affecting the relationship among functional value (β=0.020, p=0.044), emotional value (β=0.024, p=0.045), epistemic value (β=0.022, p=0.039), and indulgence value (β=0.022 p=0.049) and food safety consciousness (β=0.022, p=0.029) on their purchase intention of agricultural products via live-streaming e-commerce. However, customers' attitudes toward agricultural products shopping via Live-streaming e-commerce play a nonsignificant mediating role in affecting the relationship between social value (β=0.010, p=0.309) and their purchase intention of agricultural products via live-streaming e-commerce. Thus, most hypotheses of H7 are supported based on H7a, H7c, H7d, H7e and H7f showed significant mediating effects, without H7b.

Table 7. Hypothesis Testing Mediating Effects Results

Hypothesis	**Path Coefficient**	**t-value**	**p values**	**Results**
H7a: FUV → ATT → PI	0.020	2.018	0.044*	Significant
H7b: SOV → ATT → PI	0.010	1.018	0.309ns	Nonsignificant
H7c: EMV → ATT → PI	0.024	2.006	0.045*	Significant
H7d: EPV → ATT → PI	0.022	2.062	0.039*	Significant
H7e: IND → ATT → PI	0.022	1.972	0.049*	Significant
H7f: FSC → ATT → PI	0.022	2.178	0.029*	Significant

Note (s): *p<0.05; **p<0.01; ***p<0.001; ns=nonsignificant at .05 level

Assessment of Moderation Effect

Table 8 shows the hypotheses testing of moderating effects results, in which the findings indicate that streamers' expertise has a significant moderating effect on customers' indulgence value (β=0.100, t value=2.052, p value=0.040<0.05) to their attitudes toward agricultural products shopping via live-streaming e-commerce. Customers' online shopping self-efficacy (β=0.224, t value=4.684, p value=0.000) has a significant moderating effect on their attitudes toward agricultural products shopping via live-streaming e-commerce to purchase intention of agricultural products via live-streaming e-commerce. However, research has not found that streamers' expertise has a significant moderating effect on customers' functional value (β=-0.053, p=0.258), social value (β=-0.092 p=0.055), emotional value (β=0.079, p=0.112), epistemic value (β=-0.008, p=0.867) and food safety consciousness (β=0.030 p=0.537) to their attitudes toward agricultural products shopping via live-streaming e-commerce. Thus, hypotheses of H8e and H9 are supported and showed a significant moderation effect. The hypotheses of H8a, H8b, H8c, H8d and H8f are unsupported and have insignificant moderation effects.

Table 8. Hypothesis Testing Moderating Effects Results

Hypothesis	**Path Coefficient**	**t-value**	**p values**	**Results**
H8a: SE x FUV → ATT	0.053	1.132	0.258ns	Nonsignificant
H8b: SE x SOV →ATT	-0.092	1.921	0.055ns	Nonsignificant
H8c: SE x EMV → ATT	0.079	1.590	0.112ns	Nonsignificant
H8d: SE x EPV → ATT	-0.008	0.168	0.867ns	Nonsignificant
H8e: SE x IND → ATT	0.100	2.052	0.040*	Significant
H8f: SE x FSC → ATT	0.030	0.618	0.537ns	Nonsignificant
H9: OSS x ATT→ PI	0.224	4.684	0.000***	Significant

Note (s): *p<0.05; **p<0.01; ***p<0.001; ns=nonsignificant at .05 level

Furthermore, SmartPLS 4.1 provides simple slope plots in the results report to explain the moderation effect relationship. Figure 2 shows that high streamers' expertise (i.e., +1 standard deviation above the mean; green line) can drive a stronger relationship (i.e., steeper line) between IND and ATT. It illustrates that compared to low streamers' expertise (i.e., -1 standard deviation below the mean; red line), high streamers' expertise will more strongly transform customers' indulgence value to affect their attitudes toward agricultural products shopping via live-streaming e-commerce. Thus, H8e was supported.

Figure 2. Simple slope plot of Hypothesis of H8e

Figure 3. Simple slope plot of Hypothesis of H9

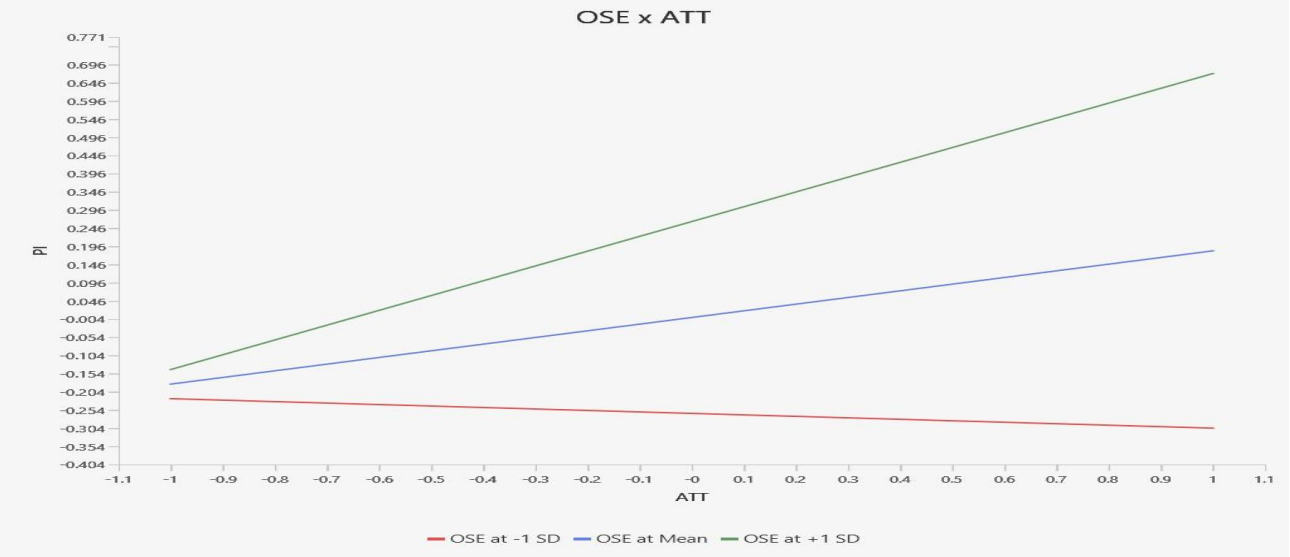
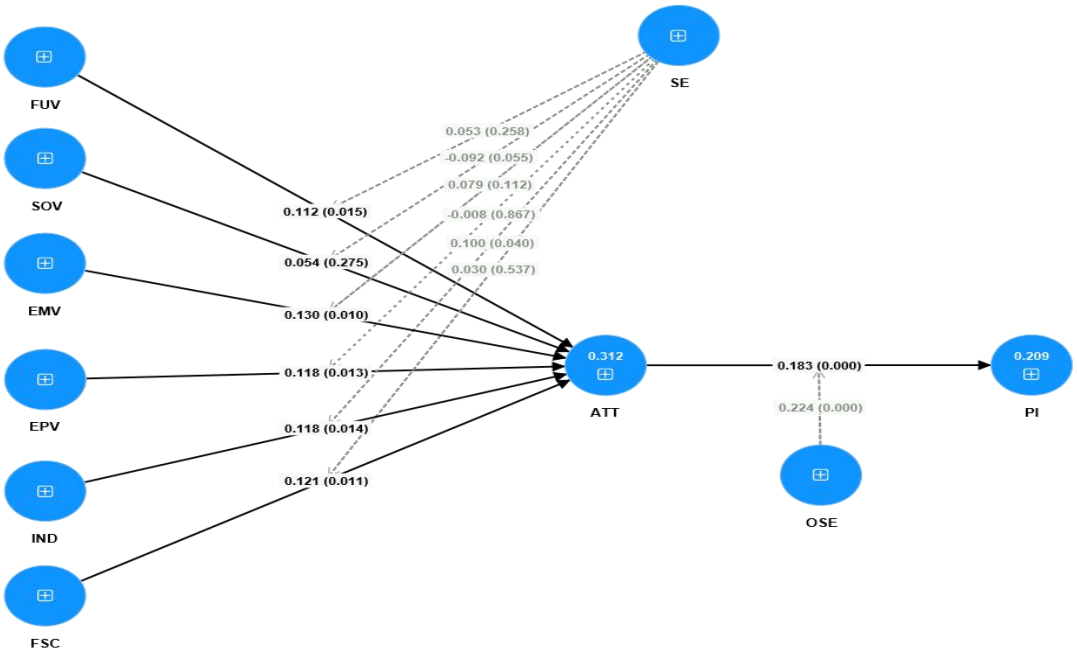


Figure 4 shows that for individuals with high online shopping self-efficacy (i.e., +1 standard deviation above the mean; green line), there is a stronger relationship (i.e., steeper line) between ATT and PI. For individuals with low Online shopping Self-efficacy (i.e., -1 standard deviation below the mean; red line), the slope is flatter. It illustrates that compared to customers with low online shopping self-efficacy, customers with high online shopping self-efficacy will more strongly transform their attitudes toward agricultural products shopping via live-streaming

e-commerce to purchase intention of agricultural products via live-streaming e-commerce. Thus, H9 was supported.

Figure 4. Theoretical model with results



4. Discussions and conclusions

Several key findings emerged from the results, aligning with prior research on live-streaming consumption value (Cao et al., 2022; Lin & Chen, 2019; Tan, 2024; Wen et al., 2018; Wongkitrungrueng & Assarut, 2020). Emotional value was the strongest predictor of consumers' attitudes toward agricultural products via live-streaming e-commerce, followed by food safety consciousness, epistemic value, indulgence, and functional value. This suggests that consumers in China prioritize emotional connections and food safety when making purchasing decisions in this context. E-commerce platforms and streamers should focus on building emotional rapport, ensuring food safety transparency, providing epistemic value, offering indulgent experiences, and highlighting product functionality. Surprisingly, social value had no significant impact on consumer attitudes, possibly due to the private, consumable nature of agricultural products, which may lack social signaling compared to luxury goods (Tan, 2024).

The study confirms that attitudes are a key link between consumption values and purchase intention, consistent with past research (Mainardes et al., 2017; Homer & Kahle, 1988). The direct impact of attitude on purchase intention is significant (Peng et al., 2023; Su, 2019), and attitude mediates the relationship between consumption values (excluding social value) and purchase intention (Liu et al., 2024; Tiwari et al., 2023; Yu & Zheng, 2022). This emphasizes the importance of fostering positive attitudes in live-streaming e-commerce for agricultural products to drive purchasing intentions.

Additionally, streamers' expertise moderates the relationship between indulgence value and attitudes (Liao et al., 2023), but not for other consumption values. Consumers may prioritize the inherent quality of agricultural products over streamers' expertise for functional, social, emotional, epistemic, and food safety concerns. Factors such as the live stream's atmosphere or the

transparency of product information may outweigh the streamer's expertise in shaping attitudes (Wang et al., 2022).

Finally, online shopping self-efficacy significantly moderates the relationship between attitudes and purchase intention, consistent with existing literature (Yi & Gong, 2008; Zha et al., 2013). Platforms should enhance user self-efficacy through user-friendly design and clear information to convert positive attitudes into purchase intentions, boosting sales in live-streaming e-commerce for agricultural products.

4.1 Theoretical implications

First, the results indicate that based on the value-attitude-behavior model, Hofstede's cultural dimensions theory and Schwartz's Theory of Basic Human Values can extend to the theory of consumption value as conditional value, which can apply to the context of agricultural products live-streaming e-commerce. By combining consumer value theory with these models and theory, the research makes theoretical contributions to the existing literature. In other words, this study offers new theoretical insight and model into agricultural products shopping behavior in live-streaming context underpinned theory by the theory of consumption value and supported theory by the value-attitude-behavior model, Hofstede's cultural dimensions theory and Hofstede's cultural dimensions theory and Schwartz's Theory of Basic Human Values can be extended. This approach offers a framework to examine and predict how diverse consumer values shape attitudes and purchase intentions toward any live-streaming e-commerce platform across various consumer segments.

Secondly, this study indicates that consumers' consumption values directly influence their attitudes, which indirectly affect their purchase intentions toward agricultural products live-streaming e-commerce. Although many researchers have demonstrated that consumer value or perceived value can influence consumer purchase behavior in general product markets (Cao et al., 2022; Lin and Chen, 2019; Tan, 2024; Wen et al., 2018), research on the importance of perceived consumer value in the live-streaming commerce of agricultural products is limited (Tan, 2024). This study is an extension of the research conducted by Tan (2024), which demonstrated that perceived value can boost consumers' purchase intention in agricultural products live-streaming e-commerce. This study finds that consumers' emotional value has the greatest influence on their attitudes, which indirectly affects their intention to purchase agricultural products. This indicates that consumers' purchase decisions in live-streaming e-commerce are often driven by their emotional connections and experiences rather than just rational considerations. This is also why many streamers in live streaming rooms attract consumers via personal charisma, engaging storytelling, addressing affectionately for customers and fostering a sense of live-streaming community and belonging among their customers to create emotional resonance.

Lastly, our research extends the role of streamers’ expertise and online shopping self-efficacy as boundary conditions in understanding customers’ purchase patterns on agricultural products live-streaming e-commerce in China. We shed light on the moderating role of streamers’ expertise in the relationship between customers' indulgence value and their attitudes, while consumers' online shopping self-efficacy moderates the relationship between consumer attitudes and their purchase intention toward agricultural products via live-streaming e-commerce. This extends the existing literature on the moderating effects of customer characteristics, (i.e., online shopping self-efficacy) and streamer characteristics (i.e., streamers’ expertise) in the context of live-streaming e-commerce.

4.2 Managerial implications

The findings of this research offer several implications for streamers, the live-streaming e-commerce industry and the agricultural industry.

Firstly, our findings highlight the significance of consumption value in shaping the attitudes and purchase intentions of consumers regarding agricultural products via live-streaming e-commerce. This insight, backed by factors such as functional value, emotional value, epistemic value, indulgence value and food safety consciousness, offers valuable guidance for professionals in the agricultural industry and streamers. Understanding and leveraging these consumption values can help steer consumers towards a more positive attitude, ultimately increasing their willingness to make purchases via live-streaming e-commerce strategies. For example, the streamer can initially showcase the unique functional benefits and freshness of their sale of agricultural products to stimulate consumer interest. Then, by sharing personal stories, establishing emotional connections with viewers, and fostering a sense of indulgence, the streamer can further enhance their desire for the agricultural products. Additionally, streamers can alleviate consumers' food safety concerns regarding agricultural products by showing inspection certificates or demonstrating the products during live broadcasts. This can help build trust and reassure viewers about the safety and quality of the offerings. Furthermore, responsiveness, emotional satisfaction, and popularization of agricultural product knowledge can go a long way in fostering consumer confidence and cultivating a positive perception of the live-streaming e-commerce experience.

Secondly, the findings underscore the pivotal role of attitudes as the foremost direct determinant of purchase intentions among consumers within the realm of agricultural products live-streaming e-commerce. This highlights the influential nature of customer attitudinal stance in shaping purchase intentions in the context of new digital technology services and the agricultural sector. This requires managers and streamers to continuously enhance their strengths based on the characteristics and needs of their customer base to stimulate a positive mindset of their consumers. For example, this can be achieved by providing personalized product recommendations, interactive live streaming sessions that allow viewers to ask questions and get real-time responses, behind-the-scenes tours or demonstrations that satisfy consumers' desire for novel experiences, and emphasizing the quality, freshness, and unique attributes of the agricultural products, thereby boosting their positive attitudes and purchase intention toward their products.

Thirdly, the research results underscore the moderating role of streamers' expertise in the relationship between consumer indulgence value and attitudes toward agricultural products live-streaming e-commerce. This implies that streamers should take more time to learn and understand the specific demands and indulgence desires of their consumers in this demographic. The demonstration of streamers' expertise isn't just about conveying product information, it's also a process to deliver the fun and uniqueness of agricultural products through multiple methods such as vision, taste, and hearing, stimulating the audience's desire to indulge.

Finally, the research results underscore the moderating role of online shopping self-efficacy in the relationship between consumer attitudes and their purchase intentions toward agricultural products via live-streaming e-commerce. This implies that consumers with higher levels of online shopping self-efficacy are more likely to drive their attitude to purchase intentions toward agricultural products live-streaming e-commerce via live-streaming e-commerce. Live-streaming e-commerce platforms and administrators should take steps to empower their consumers by offering clear calls to action and instructional prompts on online customer service platforms. This

can be achieved through a customer-friendly live-streaming page app design and responsive customer support. Additionally, streamers can guide their customers by offering tutorials or frequently asked questions on how to interact effectively and order processes with live-streaming e-commerce. Such initiatives will promote and enhance the overall customer experience.

4.3 Limitations and future research

This study has several limitations that should be acknowledged. First, the sample was drawn exclusively from China, limiting its geographical scope and potentially affecting the generalizability of the findings. Future research should test the proposed model in various cultural contexts and compare the results to extend the model's applicability. This would shed light on how consumers' consumption values and purchase patterns for agricultural live-streaming e-commerce may differ across countries. Besides, it's important to recognize that this research relied on TikTok customers with purposive sampling, which may potentially limit the generalizability and representativeness of the results. Hence, future research should employ more comprehensive and randomized sampling methodologies to validate and broaden the scope of our findings to cover other agricultural products live-streaming e-commerce platform customers (e.g., JD Live, Taobao Live, XiaoHongShu Live and KuaiShou Live), which will help us gain a more comprehensive understanding of Chinese consumers' consumption value preferences.

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