

THE CHINESE PEOPLE'S INTENTION TO PARTICIPATE
IN LIVESTREAM ENVIRONMENTAL MARKETING
COMMUNICATIONS BASED ON THE TECHNOLOGY
ACCEPTANCE MODEL (TAM)



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ความตั้งใจในการมีส่วนร่วมในการสื่อสารการตลาดเพื่อสิ่งแวดล้อมแบบสตรีมสดบนพื้นฐานของ
แบบจำลองการยอมรับเทคโนโลยีของชาวจีน



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การศึกษาในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของการรับรู้ประโยชน์ในการใช้งาน การรู้ถึงความสะดวกในการใช้งาน และการรับรู้ความเพลิดเพลินต่อความตั้งใจของชาวจีน ที่จะเข้ามามีส่วนร่วมในการสื่อสารการตลาดเพื่อสิ่งแวดล้อมแบบถ่ายทอดสดบนพื้นฐานของแบบจำลองการยอมรับเทคโนโลยี การศึกษานี้ดำเนินการโดยใช้แบบสอบถามออนไลน์เป็นเครื่องมือในการเก็บข้อมูลด้วยวิธีการวิจัยเชิงปริมาณ จากกลุ่มตัวอย่างจำนวน 200 คน ซึ่งเป็นชาวจีน อายุระหว่าง 18 ถึง 60 ปี และคู่มือข้อปบั้งแบบถ่ายทอดสดเกี่ยวกับผลิตภัณฑ์รักษ์โลกมาก่อน ผลการวิจัยพบว่า ผู้ตอบแบบสอบถามโดยรวมมีความเห็นในการรับรู้ประโยชน์ในการใช้งาน ($M = 4.04$), การรู้ถึงความง่ายในการใช้งาน ($M = 3.89$) และ การรับรู้ความเพลิดเพลิน ($M = 3.73$) ต่อความตั้งใจในการมีส่วนร่วมในการสื่อสารการตลาดเพื่อสิ่งแวดล้อมแบบถ่ายทอดสด โดยในด้านความตั้งใจในการมีส่วนร่วม ผู้ตอบแบบสอบถามมีความตั้งใจสูงที่จะมีส่วนร่วมในสตรีมสด ($M = 3.59$) นอกจากนี้ ผลการวิเคราะห์การถดถอยพหุคูณแสดงให้เห็นว่า การรับรู้ประโยชน์ในการใช้งาน ($\beta = 0.327$) การรู้ถึงความง่ายในการใช้งาน ($\beta = 0.259$) และ การรับรู้ความเพลิดเพลิน ($\beta = 0.250$) ล้วนมีผลกระทบเชิงบวกต่อความตั้งใจในการมีส่วนร่วมในการถ่ายทอดสด ($R^2 \text{ adj} = 0.391$) ตัวแปรอิสระที่มีผลกระทบมากที่สุดต่อความตั้งใจในการมีส่วนร่วมในสตรีมสดคือการรับรู้ประโยชน์ในการใช้งาน ตัวอย่างเช่น คนส่วนใหญ่ (มากกว่า 75%) คิดว่าการมีส่วนร่วมในการถ่ายทอดสดเพื่อขายหรือซื้อผลิตภัณฑ์สีเขียวสามารถช่วยให้ปกป้องสุขภาพของพวกเขาในสถานการณ์การแพร่ระบาดของโรคโควิด-19 (79.5%) ประหยัดเงินหรือเพิ่มรายได้ (77.5%) ค้นหาผู้ขายหรือลูกค้ามากขึ้น (76.5%) และเพิ่มประสิทธิภาพการซื้อปบั้งหรือการขาย (75.5%) จากผลการวิจัย การครั้งนี้ชี้ให้เห็นว่า ช่องทางการถ่ายทอดสด แปรนต์ และนักการตลาด จำเป็นต้องแสดงให้เห็นว่าการมีส่วนร่วมในการสื่อสารการตลาดเพื่อสิ่งแวดล้อมผ่านการถ่ายทอดสดมีประโยชน์ สนุกสนานและง่าย กลยุทธ์เหล่านี้สามารถช่วยเพิ่มความตั้งใจของผู้คนและการรับรู้ถึงการปกป้องสิ่งแวดล้อม

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The objective of the study is to study the effects of perceived usefulness (PU), perceived ease of use (PEU), and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream (IPL) environmental marketing communications based on the Technology Acceptance Model (TAM). The study is conducted in a quantitative approach by using online questionnaires as a tool to collect data from 200 respondents who are Chinese, aged between 18 to 60 years old, and have watched the Livestream shopping video about green products before. The finding result shows that overall respondents have a high level of agreement with PU (M=4.04), PEU (M=3.89), and PE (M=3.73) in participating in Livestream environmental marketing communications. In terms of intention, respondents have a high intention to participate in Livestream (M = 3.59). Furthermore, the multiple-regression analysis reveals that PU ($\beta=0.327$), PEU ($\beta=0.259$), and PE ($\beta=0.250$) all have positive effects on IPL ($R^2 \text{ adj} = 0.391$). Among them, the most influential factor towards IPL is PU. For example, most people (over 75%) think participating in Livestream to sell or buy green products can help them protect their health during COVID-19 (79.5%), save money or increase income (77.5%), find more sellers or customers (76.5%), and increase shopping or selling effectiveness (75.5%). Based on the findings, this study suggests Livestreaming platforms, brands, and marketers need to show people that participating in environmental marketing communications via Livestream is useful, enjoyable, and easy. These strategies can help increase people's intention and awareness of environmental protection.

Field of Study:	Strategic Communication Management	Student's Signature
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CHAPTER 1

INTRODUCTION

1.1 Significance of the study

Nowadays, people are paying more and more attention to environmental issues such as global warming, the decrease in greenery, and natural contamination. Different nations across the globe are starting to understand these dangers and have begun pursuing limiting the unsafe effects of their business activities on the environment (Veleva & Ellenbecker, 2001).

As consumption levels and green consumption knowledge increased, consumers started to choose eco-friendly products (Joshi & Rahman, 2015). However, the outbreak of COVID-19 and the lockdown policy and remain-at-home requests that numerous nations gave from 2020 to 2022 constrained shoppers to buy merchandise online rather than bricks and mortar shops.

Under this situation, Livestream e-commerce is gradually becoming a safe and convenient choice for people, which can also provide a different paradigm for “green,” “environmental,” and “sustainable” marketing (Kemper et al., 2019). It is not unexpected that Livestream e-commerce is becoming more popular in B2C and C2C marketing because it is ecologically friendly and encourages in-person social engagement (Addo et al., 2020). Researchers and entrepreneurs are pushing eco-

friendly products, green buying practices, and awareness of environmental marketing, market segmentation, and eco-friendly products at the same time (Dangelico & Vocalelli, 2017). As a result, modern green e-commerce entails proactive actions beyond the use of green products. (Shaina, 2019).

According to the report of CNNIC (2022), as of December 2021, China has the world's biggest web-based populace with more than 700 million Livestreaming clients, up 86.52 million from December 2020, taking up 68.2% of all Web clients. In addition, it has the biggest e-commerce economy in the world. China's consumption and production trends significantly advance sustainable growth (Li, et al., 2017). Chinese consumers at least usually comprehend sustainable consumption. Chinese consumers are aware of sustainable consumption to a greater than 70% degree. Young individuals (20–29 years old) in particular exhibit high intent and willingness, whereas adults aged 30-49 have stronger purchasing capacity for sustainable consumption.

Consequently, as Chinese citizens' knowledge of environmental preservation increases, and the rapid development of Livestream e-commerce, selling and buying green products on Livestreaming platforms is becoming more and more popular. Livestreaming e-commerce is becoming an important way to boost China's marketing vitality and possibilities of green products (Dong, 2022)

In China, on websites like Taobao and Douyin, interactive Livestream shopping anchor pages see billions of dollars in spending each year (China's TikTok) (Chen et al., 2020). Additionally, there have been growing worries about the relationship between the manufacture and marketing of green products (Wang & Fan, 2021). It is observed that Live e-commerce lowers costs and conserves energy. Presently, with a focus on Chinese e-commerce, commodities are delivered in bulk to clients in the same geographic area. Customers can group purchases, and package reuse may result in lower postage costs (Addo et al., 2020).

The Livestream shopping platform, in contrast to other Livestreaming platforms, is based on an e-commerce foundation and has a strong, results-oriented objective, namely, that more purchases should be produced by live viewers. Some retail activities, such as Singles Day (Double 11) and the eve of "618", provide a clear indication of how people's desire to shop has been affected amid serious economic difficulties in China and difficult zero- COVID policies ("Oh My God, Buy It!" China's Livestream Shopping Stars Risk Being Censored," 2022).

Also, compared with traditional e-commerce, sellers can better display their green products on Livestream e-commerce platforms. Some channels have sleek production, are surrounded by merchandise and companies, celebrities, and frantic bells, whistles, and countdowns that also give viewers a sense of urgency to make them spend more money. For example, Taobao Live, the most popular e-commerce

Livestreaming platform, can provide consumers with personalized Livestreaming content and a good shopping experience. Viewers can have real-time interaction with KOLs, sign up for the upcoming Livestream, chat with other viewers, gain access to fan-only features, and learn more about eco-friendly products, e.g., recyclable packaging, clean energy, reusable goods, and eco-friendliness goods (Kamolnoratep, 2020).

By communicating via the Livestream page, the merchants can reach their target consumers and engage with them directly. This provides an opportunity for the merchants to promote messages to the consumers and potential consumers anytime and anywhere due to the nature of Livestream as an owned media allows brands, sellers and companies to control, create, share the content and engage with the online public without too much media cost. Furthermore, because Taobao has such a large user base, JD, Pinduoduo, Douyin and Kuaishou, executing green content and other marketing practices via these platforms leverage the possibility to reach a wider range of consumers and potential consumers.

According to previous studies, there are many potential factors affecting people's intention to participate in Livestream shopping. According to Cai et al. (2018), certain Livestreaming platform characteristics—like a seller's physical attractiveness and product information—can affect viewers' intentions. Hou et al. (2019) looked at how seller sex appeal, seller humor, and seller engagement can affect people's intentions.

According to Sun et al. (2019), vendors' presentation abilities and purchasing advice can also affect customers' intentions to engage in Livestream shopping. Additionally, with the growth and widespread use of Livestream e-commerce, platform quality has become yet another important variable affecting people's behavioral intentions (Yu & Zhao, 2014).

Moreover, one of the most popular models, the Technology Acceptance Model (TAM) (Davis, 1989) is used to study the effects on people's intention to participate in or accept new technology and service. According to Davis' 1989 Technology Acceptance Model (TAM), in the context of e-commerce, people's intents might be impacted by perceived usefulness (PU) and perceived ease of use (PEU) (Dong et al., 2022). PU explains how users view the benefits that Livestreaming services offer them. PEU is the level of effortlessness that a Livestream participant would experience. Particularly, persons are more likely to engage in Livestream selling and/or shopping the higher their PU and PEU (Moghavvemi et al., 2016).

Based on Davis's model, the TAM model was created by several scholars. They looked at the possibility that people's behavioral intentions may potentially be significantly influenced by their perception of enjoyment (PE). According to Huang et al. (2016), a significant factor in the environment for technology adoption is how much individuals are considered to be enjoying themselves. According to Venkatesh (2000), perceived enjoyment is "the extent to which the action of using a specific

system is considered to be liked in its own right independent of any performance outcome ensuing from system use.” This study will investigate the possibilities of perceived enjoyment influencing people's desire to participate in live environmental communication.

From the above information, lots of green products can be seen in Livestream and the influence factors, such as PU, PEU, and PE, are significant influence factors toward people’s intention to participate in Livestream. However, because Livestream e-commerce is a relatively new and developing marketing strategy, there is still a lack of TAM-based research in this area, particularly in China. The study by Doanh et al. is the sole study on people's intentions to engage in Livestream and connected to green products (2022) about tea farmers’ intention to participate in Livestream sales in Vietnam: the combination of the Technology Acceptance Model (TAM) and barrier factors.

This article focuses on Chinese consumers who prefer Livestreaming platforms and investigates the effects of PU, PEU, and PE on their desire to engage in Livestream environmental marketing communications based on the TAM to address this literature vacuum.

1.2 Research Objectives

1. To study perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), and Chinese people's intention to participate in Livestream environmental marketing communications.

2. To study the effects of perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream environmental marketing communications.

1.3 Research Questions

1. What are the perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE) and Chinese people's intention to participate in Livestream environmental marketing communications?

2. What are the effects of perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream environmental marketing communications?

1.4 Hypotheses

H1: Perceived usefulness (PU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H2: Perceived ease of use (PEU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H3: Perceived enjoyment (PE) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

1.5 Scope of the Study

According to the Technology Acceptance Model (TAM), the aim of this study is to learn more about the perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), and intention of Chinese people to participate in Livestream environmental marketing communications. It also aims to investigate the effects of the PU, PEU, and PE on Chinese people's willingness to participate in Livestream environmental marketing. This study used an online questionnaire survey to gather data and test the research model because it is based on a quantitative methodology. Based on the literature research, the questionnaire's questions and assessment criteria was created to determine how much participation the PU, PEU, PE, and Chinese people plan to have in Livestream environmental marketing communications. The technique of purposive sampling would be employed to get information from 200 individuals (who live in China, 18-60 years old). According to the most recent CNNIC figures, the majority of Internet users in China are between the ages of 18 and 60 (2021). To participate in this survey, respondents had to have watched at least one Livestream shopping video about green items. The survey was conducted in October 2022. Due to the COVID-19 situation in China, the survey was conducted online via social media.

1.6 Operational Definition of the Variables

Chinese people refer to people who are Chinese, live in China and are aged between 18- 60 years old. They must have at least once watching experience of Livestream shopping videos about green products.

Livestream environmental marketing communications refer to the real-time audios and videos about green products (e.g., recyclable bags, energy-saving electric appliances, green food, etc) or green content (e.g., green advertising, green labels, etc.) directly from Livestream platforms like Taobao, Pinduoduo, JD, Douyin, Pinduoduo and other Livestream platforms, which are concerned with environmental issues and related topics.

Technology Acceptance Model (TAM) is used to study the effects on people's intention to participate in or accept new technology or service (Davis, 1989). It suggests that people's intentions can be influenced by perceived usefulness (PU) and perceived ease of use (PEU) in the e-commerce environment (Dong et al., 2022). Huang et al. (2016) developed the TAM and claimed that another important aspect of the adoption of technology is people's perceived enjoyment (PE).

Perceived usefulness (PU) measures how strongly a person thinks that taking part in environmental marketing communication via Livestream would improve their performance. And the measurement items are adapted from the previous research (Doanh et al., 2022; Venkatesh & Davis, 1996) as follows:

PU1. Participating in Livestream environmental marketing communications helps people find more sellers or reach more customers.

PU2. Participating in Livestream environmental marketing communications helps people save money or increase income.

PU3. Participating in Livestream environmental marketing communications helps people protect their health in the context of the COVID-19 pandemic.

PU4. Participating in Livestream environmental marketing communications can increase people's shopping or selling effectiveness.

Perceived ease of use (PEU) is the degree to which a person participating in Livestream environmental marketing communication would be free of effort. And the measurement items are adapted from the previous research (Doanh et al., 2022) as follows:

PEU1. Participating in Livestream environmental marketing communications is easy

PEU2. The tools and functions in the Livestreaming platforms are easy to use.

PEU3. Learning how to use IT in the Livestreaming platforms is easy.

PEU4. Remembering how to perform tasks during the Livestream is easy.

Perceived enjoyment (PE) is the degree to which utilizing Livestream is regarded to be enjoyable in and of itself, without regard to any performance consequences (Venkatesh, 2000). In particular, consumers would be more inclined to take part in Livestream if they felt that doing so would increase their level of

happiness when they trade or buy green items. And the measurement items are adapted from the previous research (Kim & Hall, 2019) as follows:

PE1. Participating in Livestream is enjoyable.

PE2. Participating in Livestream is pleasurable.

PE3. Participating in Livestream is fun.

PE4. Participating in Livestream can keep happy.

Intention to participate in Livestream (IPL) is described as people's likelihood to participate in Livestream environmental marketing communications. Additionally, the measuring tools for intention were modified based on earlier study (Ma, Gao, & Zhang, 2022):

IPL1. Intended to participate in Livestream environmental marketing communications.

IPL2. Predicted to participate in Livestream environmental marketing communications.

IPL3. If there was a green product, people would first purchase or sell it on Livestreaming platforms.

1.7 Expected Benefits from the Study

1. This paper seeks to advance academic understanding of the PU, PEU, PE, and Chinese population's intention to engage in Livestream environmental marketing messages. Also, the result can extend the effects on Chinese people's intention to participate in Livestream environmental marketing communications. Furthermore, the

study can benefit future studies in related fields, which can provide a research basis for further discussion on how to improve people's intention to participate in Livestream environmental marketing communications.

2. Practically, the result found in this study can provide brands or sellers with some useful Livestream environmental marketing strategies and suggestions to enhance people's behavioral intentions. Also, it can help people build awareness of environmental protection.



CHAPTER 2

LITERATURE REVIEW

2.1 Livestreaming E-commerce

2.1.1 The Definition of Livestreaming E-Commerce

The transmission of e-commerce activities and transactions over a livestreaming platform is known as livestreaming commerce. You'll need a Livestreaming area, Livestreaming technology, and infrastructure to build a cyber environment that supports real-time interaction, entertainment, social interactions, and commerce with seamless affordance signals. In this case, the livestreaming environment both creates a virtual space for streamers to stream and enables viewers to watch and engage with a channel of streamers. Consumers in traditional e-commerce can only look in one direction and view static product content (such text, photos, and pre-recorded films) online to learn more about products (Sjöblom & Hamari, 2017).

Streaming commerce has evolved and shows great promise as a ground-breaking business model because it enables dynamic, real-time communication between sellers (streamers) and watchers (consumers), provides accurate information, and incorporates hedonic variables to tempt consumers to engage in consumption processes. Viewers can develop virtual friendships with streamers, receive current information that is accurate and dynamic, and pass leisurely and enjoyable hours

watching engaging broadcasters by tuning in to live broadcasts (Sjöblom & Hamari, 2017).

According to Hou et al., (2019), audiences' consumption in e-commerce Livestreaming is distinguished from the reward given to the streamer in ordinary Livestreaming, which is to show appreciation. Wongkitrungrueng and Assarut (2020) claimed that e-commerce Livestreaming is when brands are using Livestreaming on social platforms to sell their products in real-time with sales that are better than advertisements and even surpass them. Earlier consumption in Livestreaming was mainly based on buying virtual gifts, but the streamers in e-commerce Livestreaming are selling real items.

Today's streaming commerce has developed and exhibits significant promise as an innovative business strategy. Additionally, it provides accurate information, dynamic real-time communication between sellers (streamers) and viewers (consumers) and combines hedonic factors to persuade users to engage in consumption activities. Viewers can make virtual friends with streamers, receive current information that is factual and active, and pass leisurely and enjoyable hours watching engaging broadcasters by tuning in to live events (Hilvert-Bruce et al., 2018). An attractive streamer's performance typically makes up the main component of Livestreaming commerce's promotion of commercial information. A streamer has their unique streaming style, specialty, personality, or attractiveness. A streamer is

typically a KOL, such as a well-known V-blogger (Zhao et al., 2018). Additionally, by interacting live with broadcasters, viewers can obtain instantaneous, personalized product information that best meets their needs. Additionally, streamers provide their audience with knowledge, amusement, and first-hand accounts of actual product consumption (Chen & Lin, 2018).

2.1.2 Livestreaming E-Commerce in China

Livestreaming users in China increased to 703 million as of December 2021, up 86.52 million from December 2020, accounting for 68.2% of all Internet users, per the most recent data from the China Internet Network Information Center (CNNIC, 2022). Live commerce users made up 44.9% of all Internet users with 464 million users, a rise of 75.79 million from December 2020. Live commerce and live sports broadcasting were 2021 the two most well-known Livestreaming market sectors. Livestreaming platforms in Western countries mostly serve gamers and entertainment, but in China, Livestreaming is becoming more and more popular as a way to buy and sell goods, which is helping to grow the country's e-commerce industry. The local Livestreaming e-commerce sector, according to Everbright Securities, a Chinese financial services company, was valued at over \$63 billion in 2019. This is 9% of China's \$723 billion in e-commerce sales for the same year or 1% of all the products that buyers bought in conventional stores. The top 3 e-commerce Livestreaming

services in China are ByteDance's Douyin, Taobao Live (TikTok) from Alibaba, and TikTok from Alibaba (Jun, 2020).

Taobao occupies the most important and irreplaceable position in China's e-commerce landscape on its own merits. At first, inconvenient logistics and payment methods caused obstacles to the expansion of Chinese e-commerce. Immature Internet infrastructure development, business forms and payment method restrictions give China's e-commerce future full of uncertainty (Haley, 2002). Walters et al. (2011) pointed out that the affordable prices, convenience and attentive customer service of Taobao create a quality shopping experience for consumers, and its huge pool of merchants attracts a constant flow of customers. On Taobao platform, merchants can create an online store and demonstrate their products through Livestreaming with links to products on the right side for audiences to click and buy directly, and there is a chat room for viewers to interact in the middle of the screen (Cai et al., 2018). Taobao Live enables consumers to watch Livestreams and shop at the same time, staying true to its "See Now, Buy Now" tagline.

Currently, the most well-liked short video app in China is Douyin, which rivals TikTok and has more than 400 million daily active users. It is supported by the renowned tech company ByteDance (DAUs). Despite coming in second place to Taobao Live in the e-commerce Livestreaming rankings, Douyin holds 13% of the

market in China. Due to its massive user base, Douyin has the potential to be the next big thing in Chinese e-commerce (Jun, 2020).

Kuaishou is China's second-most popular short video app, behind Taobao Live (79% market share) and Douyin (13%), with more than 200 million daily active users. Kuaishou generated 30 billion yuan in revenue in 2019 in addition to several billion from gaming and e-commerce (Jun, 2020).

2.1.3 Changes and Development of China's Livestreaming E-Commerce

China's live commerce has altered recently in three areas: the Livestreaming topic, the commodity supply, and the operational guidelines. The variety of market participants comes first. An increasing number of small and medium-sized retailers have concentrated on creating their Livestreaming channels as a result of the explosion of live commerce. According to the data, live commerce accounted for more than 55% of the roughly 1,000 Livestreaming rooms on Taobao (Taobao, 2021). Second, the regionalization of goods. In 2021, live commerce's beneficial effects on the promotion of regional retailers came to life. Through live commerce platforms, well-known brands and eco-friendly agricultural products were successfully marketed. During that time, CCTV and Pinduoduo worked together to develop a sizable live selling session that aggressively promoted premium national and organic agriculture brands (CNNIC, 2021). Operational standardization is the third. The Guidelines on Strengthening the Standardized Management of Livestreaming, the

Livestreaming Management Measures (Trial), and other legislation were published in 2021. With the implementation of laws and regulations, the live commerce monitoring system has strengthened, enhancing the defense of consumer rights and interests (CNNIC, 2021).

As more Chinese people utilize the internet, consumers are becoming increasingly aware of the interactive, social, and entertaining qualities of live streaming. Because the products are often more affordable, dependable, and accessible, users are increasingly accepting online Livestreaming and Livestreaming e-commerce. More people use live streaming for online shopping every day, and they view more Livestreaming videos (iResearch, 2021).

In conclusion, the knowledge gained from the above review of the literature regarding Livestream will be utilized to develop the questionnaire for this study and the researcher would also explain the knowledge about Livestream to the respondents to make them clearer about the Livestream platforms and shopping process.

2.2 Environmental Marketing Communications

2.2.1 Environmental Marketing

As more Chinese people utilize the internet, consumers are becoming increasingly aware of the interactive, social, and entertaining qualities of live streaming. Because the products are often more affordable, dependable, and accessible, users are increasingly accepting online Livestreaming and Livestreaming

e-commerce. More people use live streaming for online shopping every day, and they view more Livestreaming videos (Chamorro & Banegil, 2006).

The reaction to environmental issues is environmental marketing. It can be examined from several perspectives, including those related to the acquisition, manufacture, packaging, delivery, and rubbish disposal (Hartmann et al., 2005). An ethically good decision is to operate in a way that respects manufacturing practices, actual products, and post-production processes including recycling and safe waste disposal (Kotler, 2011; D'Souza, 2004). Additionally, when businesses utilize environmental marketing, they must make sure that their actions don't deceive consumers or industries or violate any environmental marketing rules or laws (Ongkrutraksa, 2007).

Employing environmentally friendly products has increased the benefits of green marketing for companies and marketers, including the opportunity for creativity (Pujari et al., 2004), reputational advantages for firms (Miles & Covin, 2000), and brand image (Chen, et al., 2006). According to Hasan & Ali (2015), green marketing gives businesses a competitive edge by encouraging positive interactions with the public and the media. Green marketing is a strategy used by businesses to educate the public about environmental challenges and demonstrate their commitment to action (Cherian & Jacob, 2012).

As a result, marketers have come to be seen as the source of innovative persuasive ideas pertinent to the current environmental issues we confront. “Environmental marketing” or “green marketing” was created by marketers (Ongkrutraksa, 2007).

2.2.2 Environmental Marketing Communications

Environmental marketing communications refer to various kinds of communication forms concerned with an environmental issue and related topic in which a company intends to inform or persuade consumers to be aware, interested, and perform an action. Environmental communications can be presented in various types, such as sustainability marketing, green marketing, public relations practices, etc. (Louie, 2021).

Environmental and ecological marketing communications' primary goals are: 1. To educate customers about the brand and the product so that the target markets are aware of the advantages of utilizing the brand's products as well as the benefits of its environmentally friendly business practices. 2. To persuade customers to choose an environmentally friendly product, alter their perception of the product, and pique their interest in the product. 3. To remind consumers that they will require eco-friendly items and to provide information on where and how to get them. 4. To thank them for choosing the suggested alternatives to eco-unfriendly products (Bakanauskas & Liesionis, 2002).

According to Gupta & Kumar (2013), effective communication is crucial for environmental marketing since it helps customers to learn about the green efforts the business is actively pursuing and defending. Consumer behavior is positively impacted by trustworthy and well-researched communication, and it also helps the business establish trust by making it seem as though the brand's goals are aligned with the long-term needs of the community (Ammenberg, 2006).

According to the conclusion, environmental marketing communication specifically “fosters a discourse with stakeholders, primarily customers, aiming at informing and educating those customers and trying to establish the social and environmental credentials of the company and its products” (Peattie & Charter, 2002). Environmental communication also tries to convey to consumers the environmental impact of a product and the company's commitment to sustainable business practices (Boztepe, 2012). The researcher can use the literature review to create the study's questionnaire and provide the respondents with an explanation of environmental marketing communications to guarantee that they can understand the survey questions.

2.2.3 Environmental Marketing Strategies

Environmental (green) marketing strategies include, for instance, the development of green products, green distribution strategies, green pricing, green advertising, and green consumption. The deployment of environmentally friendly

marketing strategies by companies or vendors will provide them a competitive edge over those that do not. Additionally, the following elements must be included in the executed marketing messages: (Dewi, 2021)

1. Employing eco-friendly marketing (advertising). In addition to wide communication through media like newspapers, magazines, radio, and television, advertising also involves direct communication intended for end users and inter-business (business-to-business) clients. Several companies have opted to utilize environmental advertising in printed or electronic media to target customers who are environmentally sensitive, the growing global green movement, and increased public awareness of environmental issues. By enticing people to buy environmentally friendly items and highlighting the benefits of their decisions for the environment and themselves, environmental advertising seeks to influence consumer purchasing behavior.
2. Using web-based and cloud-based solutions for sales promotion (Sales Promotion). Sales promotion refers to all marketing campaigns that persuade consumers to buy a green product right away or within a short window of time. Marketing will generally be associated with advertising and promotion. Because acquiring hardware, software, and human resources for information technology support in a firm comes at a high

cost, a means to lower the cost of purchasing information technology infrastructure without compromising its quality is required. Utilizing cloud computing, a platform that offers comprehensive information services and makes it simpler for customers to choose suitable green products, is one action that may be made (Fouad 2019).

3. Public Relations using large-scale data (Public Relations). In order to achieve specific goals based on mutual understanding, public relations all planned communication, including both incoming and outgoing information, between a company and all of its stakeholders. Big data is seen as an intelligent method of managing information on both an internal and external level. It can be utilized to maintain positive public relations since it aids an organization in reaching its goals and making better judgments. (Fouad, 2019)
4. Online engineering systems for direct sales (Personal Selling). Personal selling is when a vendor contacts a potential customer directly (person-to-person communication). In this case, the vendor wants to help or persuade potential customers to buy the green product offered (Dewi, 2021).
5. Expansion of Marketplace In order to elicit replies and/or sales transactions, a corporation may engage directly with potential target

customers through direct selling. Depending on the market sector, the reach may extend beyond the confines of conventional marketplaces and travel geographically from one location to another. The ability to buy and sell anywhere makes it more convenient for customers and lowers transaction costs. (Dewi, 2021).

Additionally, it was noted that several aspects of marketing knowledge and practices should be changed to promote environmental marketing development (Peattie & Crane, 2005):

1. Redefining products within the scope of environmental marketing,
2. The desire to make changes in the markets,
3. Specifying the benefits to be gained from the use of the product,
4. Providing marketing communication that aims not only to influence but to inform,
5. Choosing a focus that goes beyond present customer needs,
6. Willing to manage demands and expectations,
7. Emphasizing cost instead of price,
8. Taking more responsibility.

2.2.4 Green Consumers and Green Products

1. Green customers are individuals who are willing to take action to alleviate the environmental catastrophe they are currently experiencing (Ongkrutraksa, 2007).

They are interested in and conscious of the environment (Soonthonsmai, 2007). Customers who started petitions boycotted companies, and actively supported environmental conservation were not uncommon (Fergus, 1991). Ottman (1992) asserts that consumers started using green products once their basic performance, quality, convenience, and cost needs were met and they realized how a green product could help resolve environmental problems. Consumers are unable to make any purchases since they are ignorant of the advantages and applications of green products.

Sustainable consumption is at least generally understood by Chinese consumers. Young people (20–29 years old) in particular show a lot of intention and willingness, whereas adults aged 30–49 have more purchasing capacity for sustainable consumption. In China, protecting the environment, lowering expenses overall, and ensuring the safety and health of food are the key motivations behind sustainable consumption (Li et al., 2017).

2. Green products are frequently referred to as ecological or environmentally friendly products. According to Shamdasani et al. (1993), green products are those that can be recycled or maintained and won't pollute the environment or harm natural resources. It is a product that has more environmentally friendly packaging or content to lessen its influence on the environment (Wasik, 1996). To put it another way, a "green product" uses methods to lessen its negative effects on the environment, such

as decreased packaging, recycled content, or the use of fewer harmful components. Krause (1993) found through his research that customers were starting to care more about their everyday routines and how they affected the environment. Some consumers have resolved to actively purchase green items as a result of their environmental concerns (Martin and Simintiras, 1995).

The use of environmental labels on goods that have received certification from independent organizations has proven to be a successful method of lowering disinformation and assisting consumers in making informed purchasing decisions. China has been increasingly promoting various sorts of environmental certifications and labeling since it introduced its first environmental labeling, China Environmental Labelling (CEL) (Li et al., 2017).

Figure 2. 1*Environmental Labels in China*

Note. From Li et al., (2017).

Additionally, the most obvious sign of a product's quality is its green brand. Branding can boost consumer trust in environmentally friendly consumption. Only 19.12% of people will buy products with a green label, nevertheless. One of the major challenges to China's development of sustainable consumption is the absence of green products. Even though sustainable food is the product that customers find to be the most acceptable, its market share is less than 10% of all the products that are available for purchase. Also uncommon in China are profitable green brands.

2.2.5 Livestream Environmental Marketing Communications

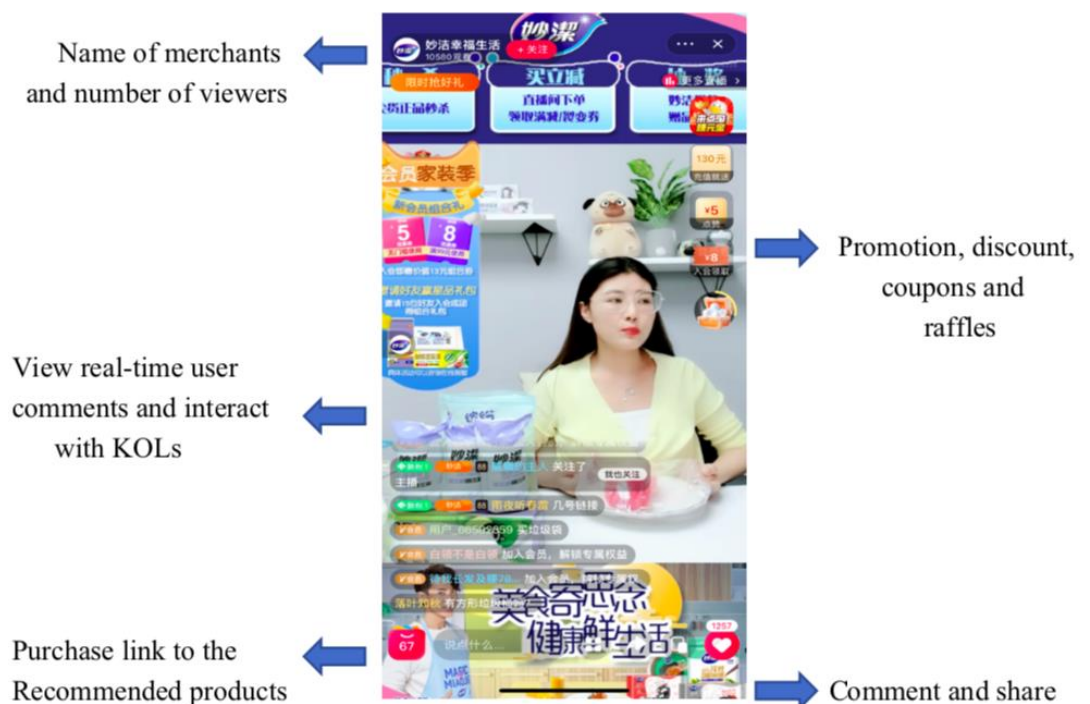
E-commerce Livestreaming has increased the marketing potential and viability of green items (Dong, 2022). Because selling green products through Livestreaming can display the products more intuitively and attract more customers, Livestreaming has gradually become a sales channel for many green brands and sellers. Buyers can also have more interaction with sellers and broadcasters on Livestreaming platforms.

Discounts, promotions, and coupons offered by sellers have also become one of the main reasons to attract buyers to use Livestreaming platforms to buy green products (Fu, 2021).

For example, Taobao Live, where businesses and KOLs use livestreaming to promote to their followers and customers, has emerged as one of the forms of the fastest-growing sales on China's retail marketplaces.

Figure 2. 2

Taobao Live Page of Selling Biodegradable Eco-Friendly Garbage Bags



Note. This figure is from the Live page of the brand: Miaojie. (2022). Taobao Live.

Retrieved September 26, 2022, from Taobao Live Page: <https://m.tb.cn/h.UcRbuZM>.

According to data from Alibaba regarding online purchases in 2015 (Alibaba Research Institute, 2016), sales of green products overall are dominated by household appliances, followed by food and mother-and-child care products. Since young customers, particularly those born in the 1980s and 1990s, make up the bulk of online buyers, household essentials and mother/childcare products are following the age and life stages of consumer goods.



Table 2. 1*The Data of Alibaba in 2015 Online Purchasing of Green Products*

Rank	Category	Customer Interest	Keywords
1	Home improvement supplies (home, building materials, etc.)	★★★★★	Non-toxic, handmade, no formaldehyde, E0 level, acrylic, etc.
2	Household goods (bedding, kitchen utensils, storage, etc.)	★★★	Environmental-friendly, nontoxic, food-grade, lead-free, etc.
3	Home appliances (large appliances, living appliances, etc.)	★★★	Energy saving, water saving, energy saving, environmental protection, frequency conversion, air purification lights
4	Pregnant baby supplies (maternity wear, diapers, children's clothing, etc.)	★★★	Radiation, antibacterial, natural, a level, no fluoride, etc.
5	Food (grain and oil, salt, snacks, fresh, etc.)	★★	Green, organic, the original ecology, no added, no anti-corrosion, no color, etc.
6	Clothing (men's, women's clothing, etc.)	★★	Cotton, cotton, linen, modal, hand, etc.
7	Personal care (beauty, essential oils, nursing, etc.)	★★	Natural, environmentally friendly, organic, negative ions, no silicon, etc.

Note. The number of stars represents the consumer's level of interest. For example, five stars indicate a high level of interest, and one star indicates a low level of interest.

Source: Alibaba Research Institute. (2016). Report on China's Green Consumer.

2.3 Intention to Participate in Livestream

The intention or behavioral intention of a person is their perceived likelihood or subjective probability that they will engage in a specific behavior (Silton et al., 2020). Intention, according to Mowen, is the desire of customers to act in particular ways when holding, disposing of, and using goods or services (2002). Customers may become inspired as a result to learn more, share their experiences with a product with others, purchase a certain good or service, or dispose of something in a particular way. A claim that ties to potential future behaviors are what Simamora (2003) refers to as behavioral intention.

Customer satisfaction with the goods and services they obtain from suppliers of goods and services determines consumer behavior and intentions toward goods and services (Ratnasari et al., 2020). A customer's behavior and intentions may be positively or negatively impacted by how satisfied they are with the products and services they have received. Management will benefit from an understanding of consumer behavior as they work to produce goods and services that meet consumer needs and preferences. The likelihood of taking a particular action is typically what motivates customer behavior (Ongsakul et al., 2020).

According to Davis (1986), perceived usefulness (PU) and action intention both have a direct impact on customers' actual behavior based on TAM. In addition, according to Tjiptono (2011) dimensions for behavioral intentions can be:

1. The readiness to pay, or to pay more than one should in order to acquire benefits.
2. The propensity to switch is a behavior that shows whether a person wants to move or not to a rival.
3. Customers who are loyal to a business (or its goods or services) and who routinely make repeat purchases cannot be persuaded to switch and refer others by rivals.

In conclusion, in this research, the intention to participate in Livestream can be described as people's likelihood to participate in Livestream environmental marketing communications. And the knowledge gained from the above review of the literature regarding the intention to participate in Livestream will be utilized to develop the questionnaire for this study.

2.4 Technology Acceptance Model (TAM)

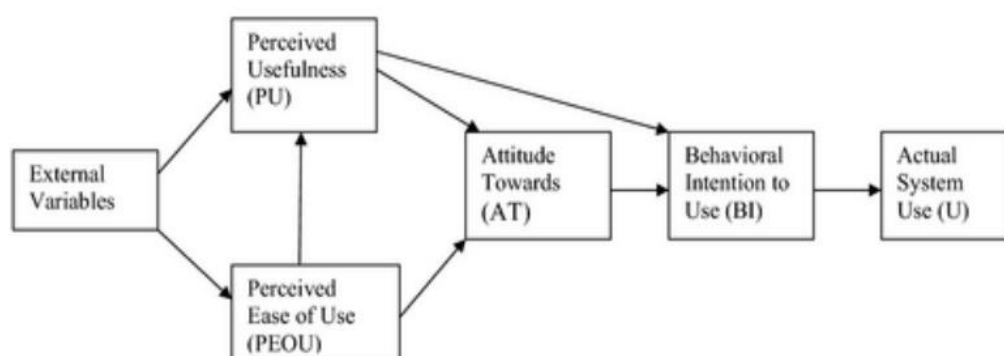
The personal computer became widely utilized in the 1980s because of technological advancements. Individuals were hesitant to utilize personal computers since so few people have the technical know-how to use one. The technology acceptance model is one of the most widely used methods for analyzing people's acceptance of technology (TAM). Davis proposed the technology acceptance model (TAM) in 1989 (Davis, 1989). Davis tried to find out how people respond to getting information from computers. Users' attitudes and acceptance of new information

systems have a greater impact on the successful adoption of information technology (IT).

Davis created the Technology Adoption Model (TAM) in 1989, which makes use of the variables perceived usefulness (PU) and perceived ease of use (PEU) to forecast user acceptance (PEU). Perceived utility and perceived ease of use are the major elements influencing someone's intention to use technology. Perceived usability is “the amount to which the user expected the target system to be free of efforts,” and perceived usefulness is “the prospective user's subjective likelihood that employing a certain application system will increase his or her task performance within context” (Davis et al., 1989).

Figure 2. 3

Technology Acceptance Model



Note. From Davis (1989).

According to Davis (1989), when the environment and time change, other factors may have an impact on consumers' intentions. Still, the perceived usefulness and

simplicity of usage could be taken into account. The Technology Acceptance Model (TAM) can theoretically be used to describe user behavior through PU and PEU in the current e-commerce context.

Perceived usefulness (PU) refers to users' perceptions of the value that Live streaming networks offer. For instance, suppliers may benefit significantly from two Livestreaming services. Selling via Livestream can assist them in making more money because online sales make it simple to connect with clients wherever. Additionally, this sales channel enables customers to view product details without having to pay for or take time off from travel (Peng et al., 2021). In other words, Livestream sales allow companies to reach out to more clients for less money, which can persuade them to use Livestream sales. Livestream sales allow sellers to communicate with customers without having to establish eye contact, which has non-financial benefits. Such online communication lessens the risk of infection and COVID-19 transmission (Doanh et al., 2022).

Perceived ease of use (PEU) measures how effort-free a Livestream environmental marketing communication participant would be. Particularly, consumers are more inclined to engage in Livestream selling or purchasing the higher their opinion of ease of usage.

Perceived enjoyment (PE) has proved helpful in explaining how people use technology. By "the extent to which the action of utilizing a certain system is

regarded to be enjoyed in its own right separate from any performance consequence ensuing from system use," Venkatesh (2000) defined enjoyment as in use. Based on Davis's model, the TAM model was created by several scholars. Researchers looked at how perceived enjoyment (PE) might have a significant impact on people's behavioral intentions in an online setting (Huang et al., 2016). For instance, in mobile apps, user satisfaction is crucial to know how users behave (Kim et al., 2017). Based on the aforementioned findings, this research examines how Livestream environmental messaging affects people's intentions by using felt enjoyment as an independent variable.

In conclusion, the knowledge gained from the above review of the literature regarding TAM will be utilized to develop the framework and hypotheses for this study. The literature regarding PU, PEU, PE and intention to participate in Livestream based on TAM will be utilized and adapted to develop the questionnaire for this study.

2.5 Related Research

According to the review of the literature, TAM is a method that is widely used to look into the elements that affect software adoption and people's intention to utilize technology. Sanchez-Franco (2010) used the technology acceptance model to analyze the value of employing information technology as a learning platform. The results

demonstrated that it was possible to effectively predict students' intentions to engage in the learning activity by using views of utility, usability, and playfulness.

In addition, several articles have recently been published in the context of the TAM-based Livestreaming application. To determine whether tea farmers in four provinces in Vietnam's northern midlands and hilly regions intended to take part in Livestream sales, Doanh et al. (2022) merged the Technology Acceptance Model (TAM) and barrier considerations. The 398 homes with tea farm heads who are between the ages of 26 and 53 and have been in business for at least three years provided the interview data. They discovered that farmers' perceptions of Livestream sales' usability and simplicity drive their decision to engage in this channel for sales. The absence of knowledge, experience, information, professional support, and normative barriers, on the other hand, diminish tea producers' perceptions of the utility and simplicity of Livestream sales.

Ho & Yang (2015) used a questionnaire-based approach to investigate user behavior intentions on live-streaming video platforms, which is based on the Technology Acceptance Model (TAM). The outcome gave researchers a fresh perspective on individuals' intentions when using Livestreaming video sites. The intention to use Livestreaming video platforms would be influenced by attitude and perceived interaction depending on the outcome. This investigation validated the reliability of the hypotheses and the applicability of TAM in a Livestreaming

environment. The moderating effects of environmental consciousness on consumers' views of sustainability, positive attitudes, and behavioral intentions towards the subject of environmental marketing communication online were examined by Park and Kim in 2021. They also examined the results of two different kinds of green information distributed through online channels. The research showed how important consumer-generated environmental information is for firm-initiated environmental marketing, which eventually leads to improved customer satisfaction and behavioral intentions. Even while showcasing green data produced by the company and its customers is useful in raising green views, consumers may react differently depending on their levels of environmental consciousness.

According to Dong et al., excellent Livestreaming e-commerce will purportedly enhance customers' intentions to make green purchases by raising their level of environmental trust (2022). Telepresence, social presence, system quality, service quality, and information quality are all considered in this evaluation strategy. The results show a positive association between the five Livestreaming e-commerce quality characteristics employed as a criterion and green trust. The study makes suggestions for improving the Live streaming quality of green product makers to boost consumer purchase intent and reap economic and social rewards.

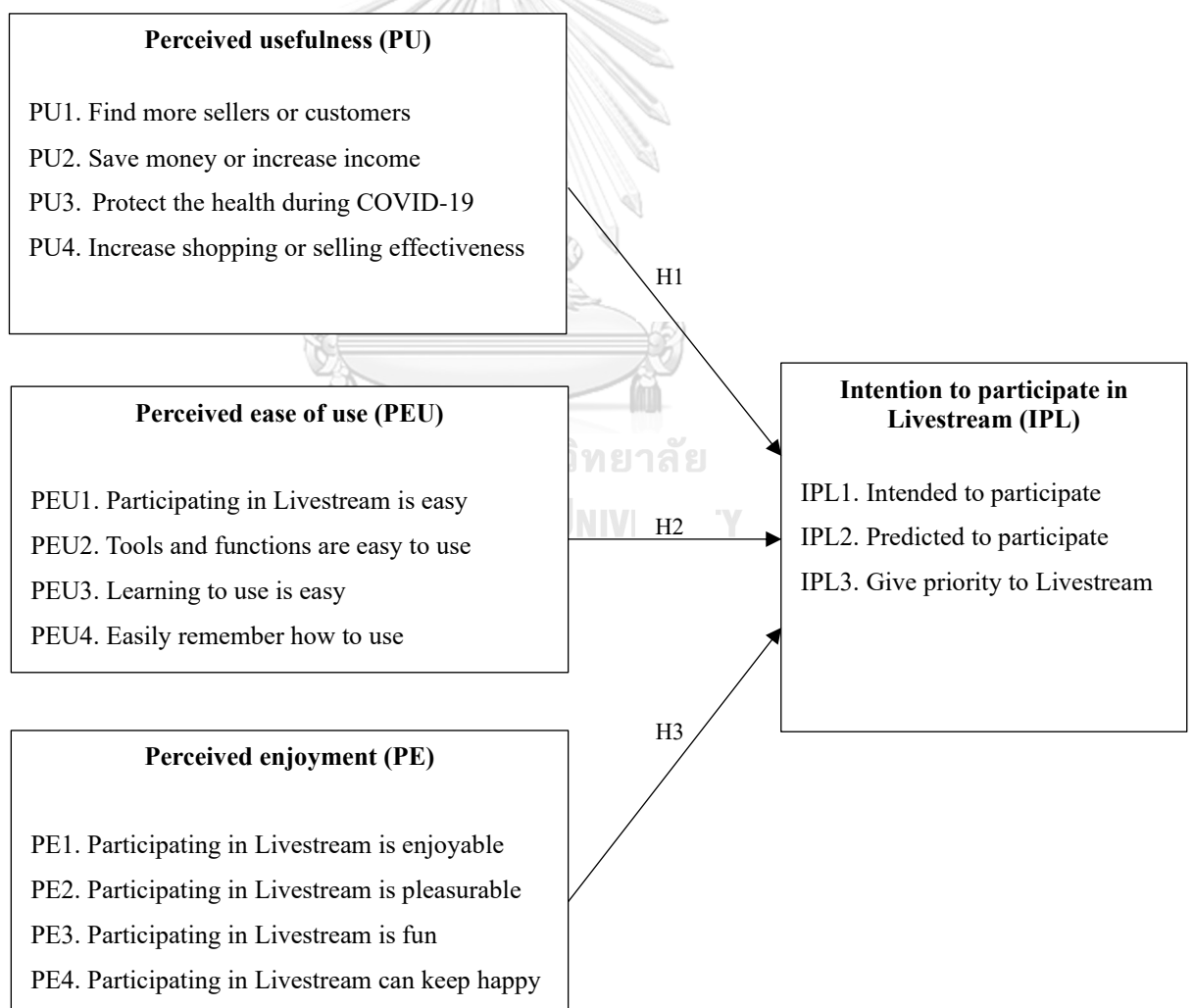
To sum up, Livestreaming e-commerce has increased the marketing potential and viability of environmentally friendly and sustainable items (Dong, 2022). However,

there is still a lack of scholarly studies employing TAM in this new marketing strategy. This work will investigate and test the influences of PU, PEU, and PE on the Chinese population's inclination to engage in Livestream environmental marketing messages to close this literature gap.

2.6 Conceptual Framework

Figure 2. 4

Conceptual Framework



CHAPTER 3

METHODOLOGY

The current study aims to explore the effects of PU, PEU and PE on Chinese people's intention to participate in Livestream environmental marketing communications. An online survey is used as the research tool to collect data quantitatively for the study. Those with an interest in Livestream environmental marketing communication and at least some past exposure to Livestream shopping videos on eco-friendly products were the target audience for the questionnaire, which was designed to gather and understand their perspectives. The methodology used in this study, including the research sample and sampling strategy, the questionnaire structure, the measurement scales used to assess the variables, and the process for gathering and evaluating data, is then in-depth addressed in this chapter.

3.1 Research Methodology

The study relies on a quantitative methodology. To gather information and evaluate the study model, an online questionnaire survey was used. Based on the literature study, the questionnaire's questions and measuring items were created. 200 people were employed in the purposive sampling method, which was used to gather data. The survey was conducted in October 2022. Due to the COVID-19 situation in China, the survey was conducted online via email or social media links. All participants were assured of their confidentiality.

3.2 Population and Sample

This survey collected data from 200 participants (who live in China, 18-60 years old). And these respondents had at least once watching experience of Livestream shopping videos about green products. According to the latest statistics from CNNIC (2021), in China, people aged between 18-60 years old, make up the largest proportion of Internet users in China.

According to the statistical method from the book *Multivariate Data Analysis* (Hair Jr. et al., 2010), the minimum sample should be no less than the ratio of 5 to 1, that is, the sample number of each questionnaire should be 5 times the number of questions. For this study, there are 23 questions, so the initial sample number should be 115. But, to improve accuracy, the researcher used a total of 200 samples.

3.3 Sampling Techniques

The purposive sampling technique was used to collect data from 200 participants (who live in China, 18-60 years old). And the questionnaire asked the participants two screening questions first: 1. Are you between 18-60 years old? 2. Have you watched Livestream shopping video before? If their answers did not meet the screening requirements of the sample, the questionnaire would be closed. If their answers could meet the screening criteria, the investigation would continue.

3.4 Research Instrument

The questionnaire was categorized into 7 sections: screening questions, 5-point Likert scale charts about PU, PEU, PE and intention to participate in Livestream

(IPL), demographic questions, and an open-end question. The 23 questions survey was distributed in two languages, English and Chinese.

Section1. Screening questions

To collect valid responses, two questions were asked to establish that they have at least once watching Livestream shopping video experience about green products, who are aged between 18-60 years old. Only those that meet the requirements can answer further.

Section 2. Perceived usefulness (PU) of Livestream environmental marketing communications

The questionnaire investigated the perceived usefulness (PU) of Livestream environmental marketing communications through a 5-point Likert scale chart from 1 (strongly disagree) to 5 (strongly agree). There are 4 statements in this section to measure the PU, which are adapted and compressed into 4 statements on the dimensions of previous research (Doanh et al., 2022; Venkatesh & Davis, 1996).

Section 3. Perceived ease of use (PEU) of Livestream environmental marketing communications

The questionnaire investigated the perceived ease of use (PEU) of Livestream environmental marketing communications through a 5-point Likert scale chart from 1 (strongly disagree) to 5 (strongly agree). There are 4 statements in this section to

measure the PEU, which are adapted and compressed into 4 questions on the dimensions of previous research (Doanh et al., 2022).

Section 4. Perceived enjoyment (PE) of Livestream environmental marketing communications

The questionnaire investigated the perceived enjoyment (PE) of Livestream environmental marketing communications through a 5-point Likert scale chart from 1 (strongly disagree) to 5 (strongly agree). There are 4 statements in this section to measure the PE, which are adapted and compressed into 4 questions on the dimensions of previous research (Kim & Hall, 2019).

Section 5. Intention to participate in Livestream environmental marketing communications

The questionnaire investigated the intention to participate in Livestream environmental marketing communications through a 5-point Likert scale chart from 1 (strongly disagree) to 5 (strongly agree). 3 statements in this section measure the intention, which are adapted and compressed into 3 questions on the dimensions of previous research (Ma, Gao & Zhang, 2022).

Section 6. Demographic questions

The respondents answered general demographic questions such as gender, revenue, education level, occupation and relationship status. The demographic

questions are multiple choices questions, which can provide descriptive data and basic information about respondents.

Section 7. Open-end question

There is an open-end question for respondents to ask what makes them participate in Livestream for green products. To further explore and discuss the effects on Chinese people's intention to participate in Livestream for green products. And explore other factors that may affect people's participation, to provide suggestions for further study.

3.5 Measurement of the variables

3.5.1 Research Hypotheses

H1: Perceived usefulness (PU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H2: Perceived ease of use (PEU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H3: Perceived enjoyment (PE) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

According to the research hypotheses, 4 variables are studied in this research which include 3 independent variables: perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), and 1 independent variable: intention to participate in Livestream (IPL). The study aims to explore the effects of PU, PEU and

PE on Chinese people's intention to participate in Livestream environmental marketing communications.



Table 3. 1*Questionnaire Variables, Codes, and Statements*

Variables	Codes	Statements
Perceived Usefulness (PU) Adapted from (Doanh et al., 2022; Venkatesh & Davis, 1996)	PU1	Participating in Livestream environmental marketing communications helps me find more sellers (as or suppose I am a consumer) or reach more customers (as or suppose I am a seller).
	PU2	Participating in Livestream environmental marketing communications helps me save money (as or suppose I am a consumer) or increase income (as or suppose I am a seller).
	PU3	Participating in Livestream environmental marketing communications helps me protect the health of myself, my family, and the community in the context of the COVID-19 pandemic.
	PU4	Participating in Livestream environmental marketing communications can increase my shopping (as or suppose I am a consumer) or selling effectiveness (as or suppose I am a seller).
Perceived Ease of Use (PEU) Adapted from (Doanh et al., 2022)	PEU1	Participating in Livestream environmental marketing communications is easy.
	PEU2	The tools and functions in the Livestreaming platforms are easy to use.
	PEU3	Learning how to use IT in the Livestreaming platforms is easy.
	PEU4	I easily remember how to perform tasks during the Livestream.
Perceived Enjoyment (PE) Adapted from (Kim & Hall, 2019)	PE1	Participating in Livestream environmental marketing communications is enjoyable for me.
	PE2	Participating in Livestream environmental marketing communications is pleasurable for me.
	PE3	Participating in Livestream environmental marketing communications is fun for me.
	PE4	Participating in Livestream environmental marketing communications keeps me happy.
Intention to Participate in Livestream (IPL) Adapted from (Ma, Gao & Zhang, 2022)	IPL1	I intended to participate in Livestream environmental marketing communications.
	IPL2	I predicted that I would participate in Livestream environmental marketing communications.
	IPL3	If there was a green product that I would like to purchase (as or suppose I am a consumer) or sell (as or suppose I am a seller), I would first choose Livestreaming platforms.

3.5.2 Check for Reliability and Validity

In terms of the check for reliability and validity, when the questionnaire review has been completed, the researcher tests the questionnaire with the population characteristics that are close to the real sample (Pre-test) with 30 sets. Cronbach's Alpha coefficient is used to analyze the results for credibility. The researcher has set the Alpha value at 0.70 or higher to measure the accuracy according to the formula for deriving Cronbach's Alpha coefficient. Then, this table is the confidence test result of this questionnaire, which is based on Cronbach's Alpha coefficient formula:

Table 3. 2

Cronbach's Alpha for the Variables

Variable	Number of items	Cronbach's Alpha
Perceived usefulness (PU)	4	0.739
Perceived ease of use (PEU)	4	0.765
Perceived enjoyment (PE)	4	0.851
Intention to participate in Livestream (IPL)	3	0.829

3.6 Data Collection and Data Analysis

The data is collected from October to November 2022 at <https://www.wjx.cn> using an online questionnaire as the instrument. The link to the survey questionnaire is posted on Wechat, QQ, Weibo, Red, and Baidu Post Bar. SPSS (Statistical Package for the Social Sciences) program is used to assess and analyze the gathered data.

The analysis of the results was described through descriptive statistics, which includes the means, standard deviation, percentage, and frequency. The finding will include the use of multiple regression analysis to test the influence of the independent variables (PU, PEU, PE) on the dependent variable (IPL). The results of this study are reported in the next chapter.



CHAPTER 4

RESULTS

The results from a survey that a sample of 200 respondents who matched our criteria for targeting completed are presented in this chapter. In October 2022, the information was gathered. The findings are segmented into descriptive statistics, inferential analyses of hypotheses and analyses of the open-end question. The regression analysis was carried out by using SPSS to see if there are effects of perceived usefulness (PU), perceived ease of use (PEU), and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream environmental marketing communications. The survey was shared on Wechat, Webo, Little Red Book, and Baidu Post Bar.

4.1 Descriptive Statistics

4.1.1 General Demographic Description

This part illustrates the general demographic data of the respondents. Gender, monthly revenue, the highest level of education, occupation, and relationship status are among the demographics. A total of 235 questionnaire responses were gathered. 35 questionnaires were eliminated because the respondents did not qualify for the questionnaire's screening phase.

Table 4. 1*Demographic Characteristics of the sample*

Demographic Characteristics	n	%
Gender		
Female	97	48.5
Male	102	51.0
Others	1	0.5
Revenue		
Equal to or less than 3,000 RMB	53	26.5
3,000-5,000 RMB	85	42.5
5,001-7,000 RMB	41	20.5
7,001-9,000 RMB	15	7.5
More than 9,000 RMB	6	3.0
Highest Education Level		
Lower than secondary school	6	3.0
Secondary school or equivalent	100	50.0
Bachelor's degree or equivalent	80	40.0
Higher than the bachelor's degree	14	7.0
Occupation		
Student	45	22.5
Employee	117	58.5
Business owner	16	8.0
Unemployed	15	7.5
Others	7	3.5
Relationship Status		
Single	63	31.5
In a relationship (not married)	30	15.0
Married	93	46.5
Widowed	7	3.5
Divorced	7	3.5

Note. n = 200, n is the sample.

Table 4.1 shows the demographic characteristics of the samples. When classified by gender, it is found that the proportions of males and females are almost close to half and half, and the proportion of others is the least. The data shows 102 are male,

accounting for 51.0%, 97 are female accounting for 48.5%, and 1 is from others, accounting for 0.5%.

When classified by revenue, it is found that the largest number of 85 respondents with monthly income between 3,000 to 5,000 RMB accounts for 42.5%. The second-largest group of 53 respondents (26.5%) has an average monthly income of equal to or less than 3,000 RMB, followed by 41 respondents (20.5%) whose average monthly income is from 5,001 to 7,000 RMB. And 15 respondents with monthly incomes ranging from 7,001 to 9,000 RMB (7.5%). The group with the fewest responders, only 6, has an average monthly income of more than 9,000 RMB accounting for 3.0%.

When classified by the highest level of education, it is found that most of the respondents hold a secondary school education or equivalent taking up the highest proportion of 50.0%, and this group has 100 respondents, followed by 80 people who graduated from a bachelor's degree or equivalent, accounting for 40.0%. And 14 people graduated with a higher degree, accounting for 7.0%. Only 6 people hold an education level lower than secondary school accounting for 3.0%.

When classified by occupation, it is found that most of the respondents are employees, a total of 117 people, accounting for 37.01%, followed by students of 117 people, accounting for 22.5%, business owners of 16 people, accounting for 8.0%. 15 respondents are unemployed, accounting for 7.5%. Only 7 respondents are engaged in other occupations, which account for 3.5%.

When classified by relationship status, it is found that most of the respondents are married, a total of 93 people, accounting for 46.5%, followed by 63 single respondents, accounting for 31.5%. There are 30 respondents, who are in a relationship (not married), accounting for 15.0%. The number of respondents who are widowed and divorced is the same, both are 7 people and separately account for 7.5%.

4.1.2 Descriptive Results of the Variables

Table 4. 2

Frequency, Percentage, Mean, Standard Deviation and Level of Perceived Usefulness (PU) of Participating in Livestream Environmental Marketing Communications

Perceived Usefulness (PU)	Levels					M/ (SD)	Level
	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)		
PU1. Find more sellers or customers	5 (2.5)	16 (8.0)	26 (13.0)	73 (36.5)	80 (40.0)	4.03 (1.039)	High
PU2. Save money or increase income	9 (4.5)	13 (6.5)	23 (11.5)	70 (35.0)	85 (42.5)	4.04 (1.100)	High
PU3. Protect the health during COVID-19	7 (3.5)	7 (3.5)	27 (13.5)	84 (42.0)	75 (37.5)	4.07 (0.983)	High
PU4. Increase shopping or selling effectiveness	7 (3.5)	15 (7.5)	27 (13.5)	70 (35.0)	81 (40.5)	4.01 (1.077)	High
Average of Level				74 (37.1)	80 (40.1)	4.04	High

Note. Cronbach's Alpha = 0.865, Agreement Percentage of PU= mean of Agree%+ mean of Strongly agree% =77.2%.

From Table 4.2, it is found that most samples agree with participating in Livestream help protect the health of people in the context of the COVID-19

pandemic with an average of 4.07, followed by the idea that participating in Livestream can help them save money or increase income with an average of 4.04, participating in Livestream can help them find more sellers or reach more customers with an average of 4.03, and participating in Livestream can increase people's shopping or selling effectiveness with an average of 4.01.

Lastly, the samples (77.2%) agree that they can perceive the usefulness of participating in Livestream environmental marketing communications with an average of 4.04, and this score is considered a high level of agreement.

Table 4. 3

Frequency, Percentage, Mean, Standard Deviation and Level of Perceived Ease of Use (PEU) of Participating in Livestream Environmental Marketing Communications

Perceived Ease of Use (PEU)	Levels					M/ (SD)	Level
	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)		
PEU1. Participating in Livestream is easy	9 (4.5)	12 (6.0)	39 (19.5)	76 (38.0)	64 (32.0)	3.87 (1.072)	High
PEU2. Tools and functions are easy to use	7 (3.5)	10 (5.0)	37 (18.5)	86 (43.0)	60 (30.0)	3.91 (0.998)	High
PEU3. Learning to use is easy	5 (2.5)	15 (7.5)	44 (22.0)	67 (33.5)	69 (34.5)	3.90 (1.042)	High
PEU4. Easily remember how to use	7 (3.5)	12 (6.0)	39 (19.5)	80 (40.0)	62 (31.0)	3.89 (1.026)	High
Average of Level				77 (38.6)	64 (31.9)	3.89	High

Note. Cronbach's Alpha = 0.799, Agreement Percentage of PEU= mean of Agree%+ mean of Strongly agree% =70.5%.

According to Table 4.3, the majority of samples concur that the Livestreaming platforms' tools and functionalities are simple to use, scoring an average of 3.91, followed by the notion that picking up IT basics is simple, scoring an average of 3.90. With an average score of 3.89, respondents also concur that they can readily recall how to complete activities during the Livestream. With an average of 3.87, the samples' agreement that using Livestream is simple is the lowest.

Lastly, the samples (70.5%) agree that they can perceive ease of use in participating in Livestream environmental marketing communications with an average of 3.89, and this score is considered a high level of agreement.



Table 4. 4

Frequency, Percentage, Mean, Standard Deviation and Level of Perceived Enjoyment (PE) of Participating in Livestream Environmental Marketing Communications

Perceived Enjoyment (PE)	Levels					M/ (SD)	Level
	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)		
PE1. Participating in Livestream is enjoyable	7 (3.5)	22 (11.0)	42 (21.0)	79 (39.5)	50 (25.0)	3.71 (1.067)	High
PE2. Participating in Livestream is pleasurable	12 (6.0)	15 (7.5)	48 (24.0)	70 (35.0)	55 (27.5)	3.70 (1.129)	High
PE3. Participating in Livestream is fun	9 (4.5)	13 (6.5)	49 (24.5)	80 (40.0)	49 (24.5)	3.73 (1.044)	High
PE4. Participating in Livestream can keep happy	11 (5.5)	20 (10.0)	38 (19.0)	71 (35.5)	60 (30.0)	3.74 (1.152)	High
Average of Level				75 (37.5)	54 (26.8)	3. 73	High

Note. Cronbach's Alpha = 0.811, Agreement Percentage of PE= mean of Agree%+ mean of Strongly agree% = 64.3%.

From Table 4.4, it is found that most samples agree with participating in Livestream keeps them happy with an average of 3.74, followed by the idea that participating in Livestream is fun with an average of 3.73, participating in Livestream is enjoyable with an average of 3.71. And the samples have the least agreement with participating in Livestream is pleasurable with an average of 3.70.

Lastly, the samples (64.3%) agree that they can perceive enjoyment in participating in Livestream environmental marketing communications with an average of 3.73, and this score is considered a high level of agreement.

Table 4. 5

Frequency, Percentage, Mean, Standard Deviation and Level of Intention to Participate in Livestream (IPL) Environmental Marketing Communications

Intention to Participate in Livestream (IPL)	Levels					M/ (SD)	Level
	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)		
IPL1. Intended to participate	11 (5.5)	31 (15.5)	35 (17.5)	75 (37.5)	48 (24.0)	3.59 (1.170)	High
IPL2. Predicted to participate	16 (8.0)	23 (11.5)	35 (17.5)	81 (40.5)	45 (22.5)	3.58 (1.188)	High
IPL3. Give priority to live-stream	12 (6.0)	27 (13.5)	33 (16.5)	84 (42.0)	44 (22.0)	3.60 (1.147)	High
Average of Level				80 (40.0)	46 (22.8)	3. 59	High

Note. Cronbach's Alpha = 0.838, Agreement Percentage of IPL= mean of Agree%+ mean of Strongly agree% = 62.8%.

From Table 4.5, it is found that most samples agree with if there was a green product they would like to purchase or sell, they would first choose Livestreaming platforms (with an average of 3.60), followed by the idea that they intended to participate in Livestream with an average of 3.59. And respondents predicted that they would participate in Livestream with an average of 3.58.

Lastly, the samples (62.8%) agree that they would intend to participate in Livestream (IPL) environmental marketing communications with an average of 3.73, and this score is considered a high level of agreement.

4.2 Hypothesis Testing

Multiple Regression Analysis

H1: Perceived usefulness (PU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

Independent variable: Perceived usefulness (PU)

Dependent variable: Intention to participate in Livestream (IPL)

H2: Perceived ease of use (PEU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

Independent variable: Perceived ease of use (PEU)

Dependent variable: Intention to participate in Livestream (IPL)

H3: Perceived enjoyment (PE) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

Independent variable: Perceived enjoyment (PE)

Dependent variable: Intention to participate in Livestream (IPL)

The study uses data to test the influence of independent variables (PU, PEU and PE) on the dependent variable (IPL) through multiple regression analysis. The results are shown in Table 4.6.

Table 4. 6*Results of Multiple Regression Analysis*

Variable	B	SE	95% CI		β	t	p
			LL	UL			
(constant)	-0.249	0.343	-0.925	0.428		-0.724	0.470
PU	0.374	0.070	0.235	0.513	0.327	5.313	0.000*
PEU	0.321	0.075	0.174	0.469	0.259	4.287	0.000*
PE	0.289	0.073	0.145	0.433	0.250	3.964	0.000*

Note. $F(3, 196) = 43.600$, $R^2 = 0.400$, $R^2_{adj} = 0.391$, $*p < 0.05$.

From Table 4.6, the results from multiple regression analysis were calculated to predict Chinese people's intention to participate in Livestream (IPL) environmental marketing communications based on the perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE). A significant regression equation was found ($F(3, 196) = 43.600$, $p < 0.05$), with an R^2_{adj} of 0.391.

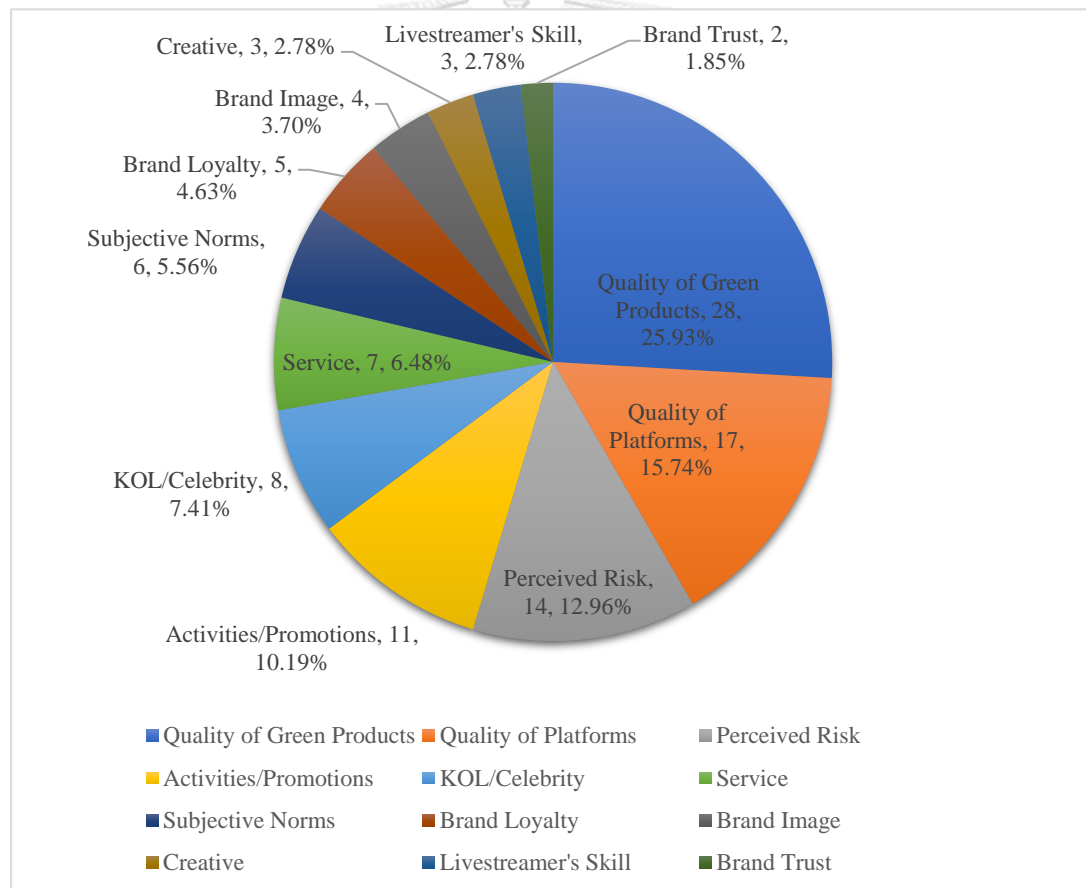
The table shows three independent variables positively affect the dependent variables: 1) the Perceived usefulness (PU) variable with Beta = 0.327; 2) the Perceived ease of use (PEU) variable with Beta = 0.259; and 3) the Perceived enjoyment (PE) variable with Beta = 0.250, meaning that when the samples perceived the usefulness, ease of use and enjoyment of participating in Livestream environmental marketing communications, their intention to participate in Livestream would be positively affected.

Three independent variables (PU, PEU and PE) can explain the relationship between dependent variables (IPL) for 39.10 percent and the equation obtained from the stepwise multiple regression analysis is statistically significant at 0.05. Therefore, H1, H2 and H3 are supported.

4.3 Analysis of Open-end Question

Figure 4. 1

Frequency and Percentage of Other Influence Factors on Intention



Note. In a total of 108 respondents effectively answered the open-end question: What makes you participate in Livestream for green products?

Figure 4.1 shows the frequency and percentage of other influencing factors on

intentions to participate in Livestream for green products. These valid answers are from 108 respondents. 28 respondents thought the Quality of Green Products is the influential factor for them, which account for the highest percentage of 25.93%, followed by Quality of Platforms (15.74%), Perceived Risk (12.96%), Activities/Promotions (10.19%), KOL/Celebrity (7.41%), Service (6.48%), Subjective Norms (5.56%), Brand Loyalty (4.63%), Brand Image (3.70%), Creative (2.78%), Livestreamer's Skill (2.78%), Brand Trust (1.85%).



CHAPTER 5

SUMMARY AND DISCUSSION

5.1 Summary

The purpose of this study is to obtain information on what are the perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), and Chinese people's intention to participate in Livestream environmental marketing communications based on the Technology Acceptance Model (TAM) and study the effects of PU, PEU, and PE on Chinese people's intention to participate in Livestream environmental marketing communications. Thus, this study will explain the following research questions:

1. What are the perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), and Chinese people's intention to participate in Livestream environmental marketing communications?
2. What are the effects of perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream environmental marketing communications?

This study conducted a quantitative survey with a sample size of 200 valid respondents (live in China, 18-60 years old). The information was gathered in October 2022 by WJX, a Chinese online survey platform. The findings are segmented into descriptive statistics and hypothesis testing. The regression analysis was carried out

by using SPSS to see if there are effects of perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE) on Chinese people's intention to participate in Livestream environmental marketing communications. The survey was shared on Wechat, Webo, Little Red Book, and Baidu Post Bar (environmental protection interest group). And the questionnaire is categorized into 7 sections (23 items): screening questions, 5-point Likert scale charts about perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), intention to participate in Livestream environmental marketing communications, demographic questions, and an open-end question.

Firstly, the study checked the scale's validity and reliability. The Cronbach's Alpha values for the four variables are higher than 0.07, which is acceptable. This study used SPSS to assess the questionnaires from 200 samples and the statistics for each question are described using descriptive statistical methods including: 1) the general demographic description (frequency and percentage), 2) frequency, percentage, mean, standard deviation, and level of PU, PEU, and IPL.

Secondly, Multiple Regression Analysis was used to test the following three hypotheses:

H1: Perceived usefulness (PU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H2: Perceived ease of use (PEU) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

H3: Perceived enjoyment (PE) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

Thirdly, the study analyzed and summarized the open-end questions about what other factors make them participate in Livestream for green products.

Demographic

Of the total of 200 respondents, 102 respondents are males (51.0%), and 97 respondents are females (48.5%), while the remaining 1 respondent accounting for 0.5% identified as others. In terms of revenue, the largest number of 85 respondents with monthly income between 3,000 to 5,000 RMB accounts for 42.5%. The second-largest group of 53 respondents (26.5%) has an average monthly income equal to or less than 3,000 RMB. In terms of the highest education level, most of the respondents hold a secondary school education or equivalent taking up the highest proportion of 50.0%, and this group has 100 respondents, followed by 80 people who graduated with a bachelor's degree or equivalent, accounting for 40.0%. In terms of occupation, most of the respondents are employees, a total of 117 people, accounting for 37.01%, followed by students of 117 people, accounting for 22.5%. And in terms of relationship status, most of the respondents are married, a total of 93 people, accounting for 46.5%, followed by 63 single respondents, accounting for 31.5%.

Perceived Usefulness (PU)

Perceived usefulness (PU) in this study includes four dimensions - PU1: find more sellers or customers, PU2: save money or increase income, PU3: protect the

health during COVID-19, and PU4: increase shopping or selling effectiveness. Among the four dimensions, PU3 received the highest mean score of 4.07 (SD=0.983), followed by PU2 with a mean score of 4.04 (SD=1.100), PU1 with a mean score of 4.03 (SD=1.039), and PU4 with a mean score of 4.01 (SD=1.077). Through the analysis of the data collection, it was concluded that the four dimensions of the variable received a high level of agreement with an average of 4.04, and this score is considered a high level of agreement.

Perceived Ease of Use (PEU)

Perceived Ease of Use (PEU) in this study includes four dimensions - PEU1: participating in Livestream is easy, PEU2, tools and functions are easy to use, PEU3: learning to use is easy, and PEU4: easily remember how to use. Among the four dimensions, PEU2 received the highest mean score of 3.91 (SD=0.998), followed by PEU3 with a mean score of 3.90 (SD=1.042), PEU4 with a mean score of 3.89 (SD=1.026), and PEU1 with a mean score of 3.87 (SD=1.072). Through the analysis of the data collection, it was concluded that the four dimensions of the variable received a high level of agreement with an average of 3.89, and this score is considered a high level of agreement.

Perceived Enjoyment (PE)

Perceived Enjoyment (PE) in this study includes four dimensions - PE1: participating in Livestream is enjoyable, PE2: participating in Livestream is pleasurable, PE3: participating in Livestream is fun, and PE4: participating in

Livestream can keep happy. Among the four dimensions, PE4 received the highest mean score of 3.74 (SD=1.152), followed by PE3 with a mean score of 3.73 (SD=1.044), PE1 with a mean score of 3.71 (SD=1.067), and PE2 with a mean score of 3.70 (SD=1.129). Through the analysis of the data collection, it was concluded that the four dimensions of the variable received a high level of agreement with an average of 3.73, and this score is considered a high level of agreement.

Intention to Participate in Livestream (IPL)

Intention to Participate in Livestream (IPL) in this study includes four dimensions - IPL1: intended to participate, IPL2: predicted to participate, and IPL3: give priority to live-stream. Among the four dimensions, IPL3 received the highest mean score of 3.60 (SD=1.147), followed by IPL1 with a mean score of 3.59 (SD=1.170), and IPL2 with a mean score of 3.58 (SD=1.188). Through the analysis of the data collection, it was concluded that the four dimensions of the variable received a high level of agreement with an average of 3.59, and this score is considered a high level of agreement.

Hypotheses Testing Conclusion

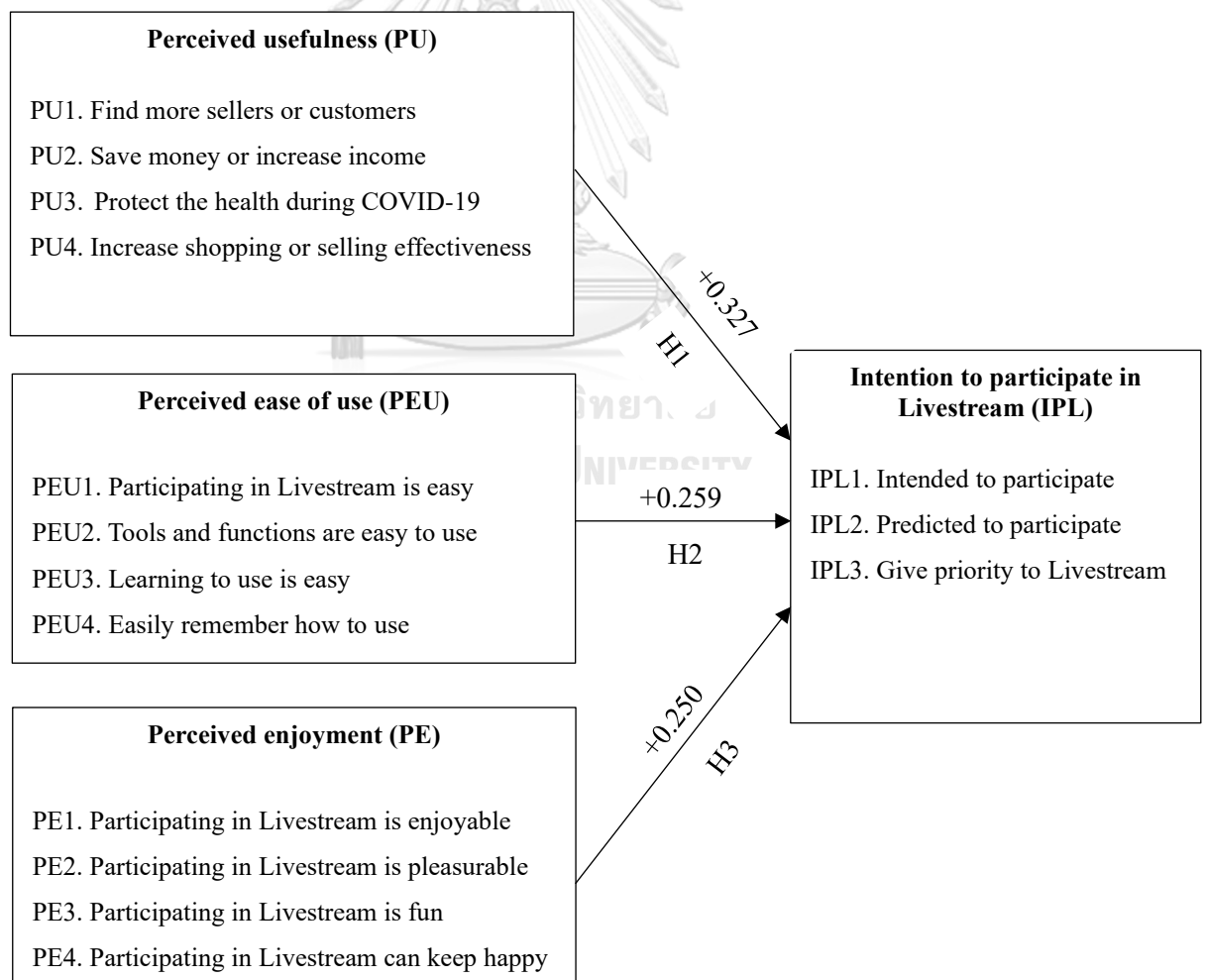
The results from multiple regression analysis shows there are three independent variables (PU, PEU, and PE) that positively affect the dependent variable (IPL):

1. Perceived usefulness (PU) variable with Beta = 0.327
2. Perceived ease of use (PEU) variable with Beta = 0.259
3. Perceived enjoyment (PE) variable with Beta = 0.250

These three independent variables (PU, PEU and PE) can explain the effects on dependent variables (IPL) for 39.10 percent (R^2 adj = 0.391) and the equation obtained from the stepwise multiple regression analysis is statistically significant at 0.05. Therefore, H1, H2 and H3 are supported. Additionally, among these three independent variables, the most influential factor towards the intention to participate in Livestream (IPL) is Perceived usefulness (PU) with a Beta value of 0.327.

Figure 5. 1

Research Findings



Note. $F(3, 196) = 43.600$, $R^2 = 0.400$, R^2 adj = 0.391, $*p < 0.05$.

5.2 Discussion

The findings from the study on the factors that influence Chinese people's intention to participate in Livestream environmental marketing communications have illustrated useful insights for different variables, such as perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment, and their effects on intention to participate in Livestream (IPL). This research also confirmed that Technology Acceptance Model (TAM) can be used in Livestream environmental marketing communications and the hypotheses are valid.

Hypothesis 1: Perceived usefulness (PU) has an effect on Chinese people's intention to participate in Livestream (IPL) environmental marketing communications.

The results of this study show that most of the respondents (77.2%) agree they could perceive the usefulness that Livestreaming platforms bring to them, and results of multiple regression analysis show PU is the most influential variable on IPL. Especially in the context of the COVID-19 pandemic, Respondents (79.5%) believe that participating in Livestream can help them protect the health of themselves, their families, and the community (PU3). The findings are similar to the previous research by Venkatesh and Davis (1996), and Doanh et al., (2022). That might be because, after the outbreak of COVID-19, the sales of many brick-and-mortar stores in China have declined. In places hit hard by COVID-19, some shops even have been asked to close. And out of health concerns, people try to avoid physical contact and maintain

social distancing. Under this situation, Livestreaming e-commerce has become one of the main ways for people to shop during the epidemic.

Because internet sales make it simple to reach clients in more locations, selling via Livestream can help sellers boost their profits. According to Alizila (2020), Livestream has developed into a crucial tool for businesses in a variety of sectors, not only because it can help retailers counteract the fall in offline sales but also because it fosters innovation in marketing and the creation of strong client relationships. E-commerce behemoths like JD.com have adopted Livestream as a new source of revenue for their companies. According to Guowei Zhang, CEO of JD Live, the Livestream division of JD.com, Livestream has been used by many businesses and shops during COVID-19 to assist mitigate the effects and losses from the pandemic (Wang, 2022).

In terms of buyers, Livestream provides them with information about green products without spending money or traveling time, these findings are similar to the research of Peng et al. (2021). Discounts, promotions and coupons offered by sellers also became one of the main reasons to attract buyers to use Livestreaming platforms to buy green products (Fu, 2021). That is probably because the monthly income of most of the respondents (42.5%) is 3,000-5,000 RMB and the second-largest group of 53 respondents (26.5%) has an average monthly income of equal to or less than 3,000 RMB (according to China Statistical Yearbook 2021, these two groups are low-income groups), leading that saving money becoming an important factor to them

(P U 2). Buyers can also have more interaction with sellers and broadcasters on Livestreaming platforms. “What you see is what you get”, transparency is one of the reasons to increase people’s shopping effectiveness. For example, people can see the display of green products intuitively via Livestream, including brands, green labels, detailed product introductions, and so on. Therefore, many people can perceive the usefulness of Livestream shopping.

Hypothesis 2: Perceived ease of use (PEU) has an effect on Chinese people’s intention to participate in Livestream environmental marketing communications.

The results of this study show that most of the respondents (70.5%) agree they could perceive the ease of use of participating in Livestream environmental marketing communication. The respondents believe that the tools, functions, and IT in the Livestreaming platforms are easy to use. And PEU could positively affect IPL. The results are consistent with Sanchez-Franco (2010).

The result of this study is also consistent with Doanh et al. (2022). Because with the continuous upgrading and improvement of the pages and functions of the Livestreaming platforms, the improvement of IT technology, the increasingly high performance of smartphones, the advent of the 5G era, the easy operation and easy-to-learn, Livestreaming platforms are gradually becoming the choice of the public.

Also, education level can affect people's knowledge level and ability to accept new things to some extent (Shefketi, 2019). Most of the respondents (100) in this study hold a secondary school education or equivalent, taking up the highest proportion of 50.0%, followed by 80 respondents who graduated with a bachelor's degree or equivalent, accounting for 40.0%. Therefore, the researcher believes that

holding a secondary school education or above level might make it easier for them to participate in Livestream.

Hypothesis 3: Perceived enjoyment (PE) has an effect on Chinese people's intention to participate in Livestream environmental marketing communications.

The results of this study show that most of the respondents (64.3%) could perceive the perceived enjoyment (PE) of participating in Livestream environmental marketing communication. Specifically, if people feel enjoyable, pleasurable, fun, and happy when they sell or buy green products through Livestream, their intention to participate in Livestream would be higher. The results are consistent with previous research of Venkatesh (2000), Huang et al. (2016), Kim and Hall (2019).

The first reason is people need and want to attain enjoyment to make their life better, especially when they meet some frustration or pressure. From the news report (Law, 2021): the pandemic has clearly (and understandably) eroded happiness globally. Since it began, the symptoms of anxiety and depression of people are more serious than before, especially during lockdown restrictions from 2019 to 2022. In China, after the outbreak of COVID-19, the prolonged lockdown and strict epidemic policies caused the economic situation to decline. Many people lost their jobs, or their incomes decreased a lot, which made the life of many families difficult. Social distancing has also alienated many relationships. In addition, to protect the health of themselves, their families and their communities, people have spent more time at home and made offline purchases less frequently. People are becoming more

dependent on smartphones and the Internet world. Compared with traditional online shopping, Livestream shopping is more interactive, real-time, and fun. Therefore, to get more enjoyment during the epidemic, people would choose to participate in Livestream shopping more than before.

The second reason is the development of technologies that bring users a better user experience, which makes them feel happy or pleasurable. For example, China's top 3 E-commerce Livestreaming platforms- Alibaba's Taobao Live, Kuaishou (Kwai), and ByteDance's Douyin (TikTok) are more and more popular in the last few years. Because they try to provide enjoyment to users through interesting music, creative stickers, games, and other interesting functions. Some interesting green products campaign could attract people's attention and increase their awareness of environmental protection such as environment-friendly bag DIY activities.

The third reason is, according to the answers to the open-end question, some respondents gave feedback that they would like to participate in the Livestream because there are the KOLs or celebrities they like in the Livestream sales, so they can interact with them and that makes them happy and enjoyable. KOL and celebrities have a great influence on advocating environmental protection and low-carbon life. People who live a similar lifestyle to their idols or role models can feel happy.

5.3 Practical Implications

Several practical implications may be taken from these findings:

5.3.1 Theoretical Implications

This research has a distinctive innovation and theoretical implication, which extend the knowledge regarding PU, PEU, PE and Chinese people's intention to participate in Livestream environmental marketing communications based on the Technology Acceptance Model (TAM). The past academic research using TAM on this new emerging marketing method remains insufficient, especially in China. This research filled this literature gap, and it also provides a research basis and suggestions for further research about TAM. In addition, this study shows that PU, PEU and PE can all positively affect IPL, and PU has the highest effect. People can draw on this research result for reference in future academic research in the environmental marketing communications field or other countries.

5.3.2 Business Implications

1. Using Livestream as a strategy to introduce green products and content is an effective and efficient strategy, and marketers should consider the positive influence of Livestream on people's intentions and use Livestream to increase people's awareness of environmental protection. Such as perceived usefulness (PU), perceived ease of use (PEU) and perceived enjoyment (PE). This is a vital strategy for brands, companies, Livestream platforms, and marketers. For example, they can provide competitive prices, high-quality green products, and a good shopping experience to increase people's intentions.

2. The survey results also show that the factor "PU3: selling or buying green products on Livestream platforms can protect their health in the context of the

COVID-19 pandemic” got the highest mean score of agreement. Therefore, marketers should highlight participating in Livestream can help people protect their health. However, as the pandemic gets better in China and more people get vaccinated, the consumption trend of people shopping offline is likely to revive, so this influence factor (PU3) may be significant only during the pandemic period. Therefore, in terms of the future sustainable development of the brands, companies and businesses, the researcher suggests that they should integrate online and offline sales to avoid the huge impact of the epidemic on sales and help them to reach audiences at different places through different ways.

3. Platforms need to provide knowledge and information about using Livestream, help and teach users how to easily participate, which could encourage people to switch to this new selling channel. Platforms need to optimize the Livestream page, make the function easy to learn, easy to operate, and not require complex equipment support. Because let the users perceive ease of use (PEU) is also one of the important strategies for Livestream platforms to attract more users.

4. Perceived enjoyment (PE) affects people's intention to participate in Livestream. Therefore, the researcher suggests that the platform should provide more entertainment features, such as background music, interactive effects, fun stickers and filters so that people can have more fun while using it. Sellers and Livestreamers can try to provide viewers with interesting interactions, skillful explanations, or attractive activities to make people feel happy, fun, or pleasurable through the Livestream. They

can use interesting green campaigns such as teaching people how to do an environment-friendly bag by themselves to attract people. And they can invite popular KOLs, or celebrities to promote the sales, and advocate a healthy, green and low-carbon lifestyle.

5. Sustainable development and environmental protection are necessary strategies for enterprises, companies, and brands if they want to have long-lasting, healthy, and sustainable development. At the same time, promoting green products and campaigns is also a way to establish a good brand image, and complete their corporate social responsibility (CSR). Today, in China, as people improve their environmental awareness, more and more people are starting to focus on environmental issues. Those companies, brands, and sellers which correctly use environmental marketing communications, can get a better brand image and more trust from people. Therefore, Livestream is a good choice for marketers to touch the target audience who care about environmental protection.

5.4 Limitations of the Study

Overall, the research was successfully conducted with acceptable and reasonable results. The three hypotheses are accepted and similar to previous empirical studies from the literature review. However, there are a few limitations of this study that can be noticed for an improvement of future studies as follows:

1. The respondents' age is not divided into different groups in the questionnaire.

Therefore, the results couldn't show the percentage of different age groups

between 18- 60 years old. Compared to a broad age group, the specific age segmentation data can help brands, or marketers to analyze and target their audience better.

2. Some survey questions are quite similar in the perceived enjoyment (PE) section, such as PE1: Participating in Livestream is enjoyable, PE2: Participating in Livestream is pleasurable, PE3: Participating in Livestream is fun, PE4: Participating in Livestream can keep happy. Even though these statements are adapted from previous studies, some respondents still think it's hard to recognize the differences between them.

5.5 Directions for Future Research

1. Future research related to this study should focus on other factors, which might affect people's intention to participate in Livestream environmental marketing communications. For example, from the open-end questions of this research, some people believe that the quality of green products, KOLs, perceived risks and other factors can also influence their intention.

2. Future research can only focus on sellers or buyers, or compare these two groups. This research designed the same survey questions for the Livestream users including sellers and buyers. However, in real life, sellers' and buyers' using purpose, and using habits are different. User interface and difficulty of using are also different for sellers and buyers. Therefore, these factors might affect these two groups to a different degree.

3. This research showed that Chinese people have a high level of intention to participate in Livestream environmental marketing communications. However, we still haven't tested whether people's intention will affect their final actual behavior (participate or not participate in the end). Thus, future research can explore more about the effects of people's intentions on people's final behavior to develop this study.

4. Future research can study whether the perceived ease of use (PEU) can affect perceived usefulness (PU) and perceived enjoyment (PE). Because the researcher found that if the Livestream platform is easy to use, it might help people save time and increase shopping or selling effectiveness, which means it's useful. Also, if it's easy to use, people will feel happy and enjoyable. Therefore, future research can explore this question further.

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APPENDIX A

Questionnaire (English Version)

Research Questionnaire

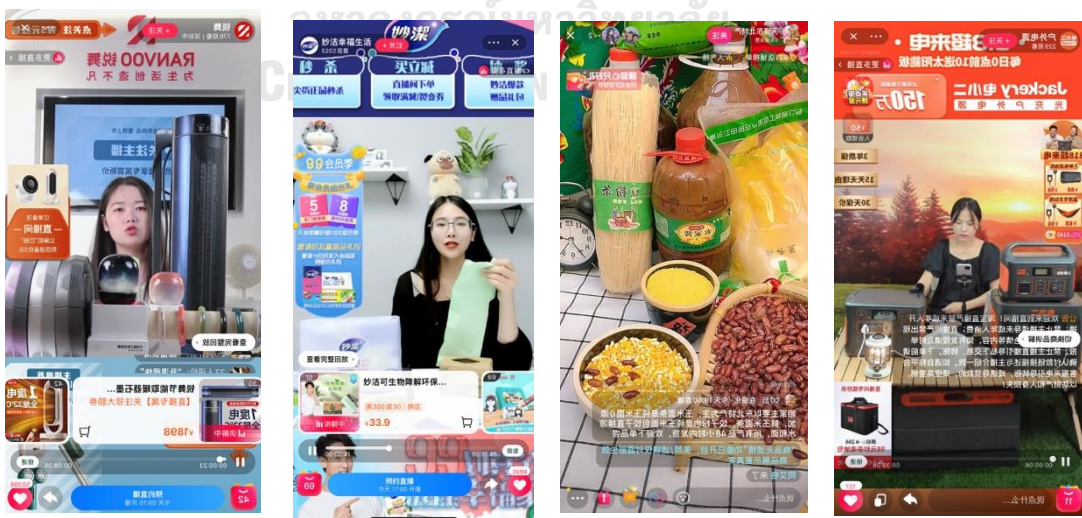
The Chinese People's Intention to Participate in Livestream Environmental Marketing Communications Based on the Technology Acceptance Model (TAM)

Note: This survey is part of research ***for educational purposes only***

Before you do this survey, the researcher wants to explain the definition of the research topic (Livestream Environmental Marketing Communications) and give some examples to you:

Livestream Environmental Marketing Communications refers to the real-time audios and videos about green products (e.g., recyclable bags, energy-saving electric appliances, green food, etc.) or green contents (e.g., green advertising, green labels, etc.) directly from Livestream platforms like Taobao, Pinduoduo, JD, Douyin, Pinduoduo and other Livestream platforms, which are concerned with environmental issues and related topics. The merchants and Livestreamers intend to inform or persuade consumers to be aware, interested, and perform actions toward environmental protection, e.g., waste management, reducing carbon emission, pollution control, saving energy, etc. Here are some examples of Livestream environmental marketing communications:

Examples of Livestream Environmental Marketing Communications:



(Source: Taobao Live and Douyin Live)

Note. From now on, this questionnaire will use “Livestream” to replace “Livestream Environmental Marketing Communication”, and the meaning is the same as above.

Section 1 Screening Question

Instructions: Please check (✓) the answer that best represents you

1. Are you between 18-60 years old?
 - 1. Yes
 - 2. No (end the survey)

2. Have you watched Livestream shopping video about green products before?
 - 1. Yes
 - 2. No (end the survey)

Section 2 Perceived Usefulness (PU) of Livestream

Instructions: Please rate the statements below according to your opinion about Perceived Usefulness by marking (✓) under the number in the scale below:
 1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5= Strongly agree.

Statement	Disagree↔Agree				
	1	2	3	4	5
1. Participating in Livestream helps me find more sellers (as or suppose I am a consumer) or reach more customers (as or suppose I am a seller).					
2. Participating in Livestream helps me save money (as or suppose I am a consumer) or increase income (as or suppose I am a seller).					
3. Participating in Livestream helps me protect the health of myself, my family, and the community in the context of the COVID-19 pandemic.					
4. Participating in Livestream can increase my shopping (as or suppose I am a consumer) or selling effectiveness (as or suppose I am a seller).					

Section 3 Perceived Ease of Use (PEU) of Livestream

Instructions: Please rate the statements below according to your opinion about

Perceived Ease of Use by marking (✓) under the number in the scale below:

1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5= Strongly agree.

Statement	Disagree↔Agree				
	1	2	3	4	5
1. Participating in Livestream is easy.					
2. The tools and functions in the Livestreaming platforms are easy to use.					
3. Learning how to use IT in the Livestreaming platforms is easy.					
4. I easily remember how to perform tasks during the Livestream.					

Section 4 Perceived Enjoyment (PE) of Livestream

Instructions: Please rate the statements below according to your opinion about

Perceived Enjoyment by marking (✓) under the number in the scale below:

1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5= Strongly agree.

Statement	Disagree↔Agree				
	1	2	3	4	5
1. Participating in Livestream is enjoyable for me.					
2. Participating in Livestream is pleasurable for me.					
3. Participating in Livestream is fun for me.					
4. Participating in Livestream keeps me happy.					

Section 5 Intention to Participate in Livestream (IPL)

Instructions: Please rate the statements below according to your opinion about Intention by marking (✓) under the number in the scale below:
1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5= Strongly agree.

Statement	Disagree↔Agree				
	1	2	3	4	5
1. I intended to participate in Livestream.					
2. I predicted that I would participate in Livestream.					
3. If there was a green product that I would like to purchase (as or suppose I am a consumer) or sell (as or suppose I am a seller), I would first choose Livestreaming platforms.					

Section 6 Demographic Question

Instructions: Please check (✓) the answer that best represents you

1. What's your gender?

1. Female 2. Male 3. Others

2. How much of your revenue per month?

1. Equal to or less than 3,000 RMB (Equal to or less than 417 USD)
 2. 3,000 -5,000 RMB (Around 417 -693 USD)
 3. 5,001 -7,000 RMB (Around 694 -970 USD)
 4. 7,001 -9,000 RMB (Around 971-1,248 USD)
 5. More than 9,000 RMB (More than 1,248 USD)

3. Highest level of education attained

1. Lower than secondary school 2. Secondary school or equivalent
 3. Bachelor's degree or equivalent 4. Higher than bachelor's degree

4. Occupation

1. Student 2. Employee 3. Business owner 4. Unemployed
 5. Others

5. Relationship status

1. Single 2. In a relationship (not married) 3. Married
 4. Widowed 5. Divorced

Section 7 Open-end Question

1. what makes you participate in Livestream for green products?



APPENDIX B

Questionnaire (Chinese Version)

研究问卷

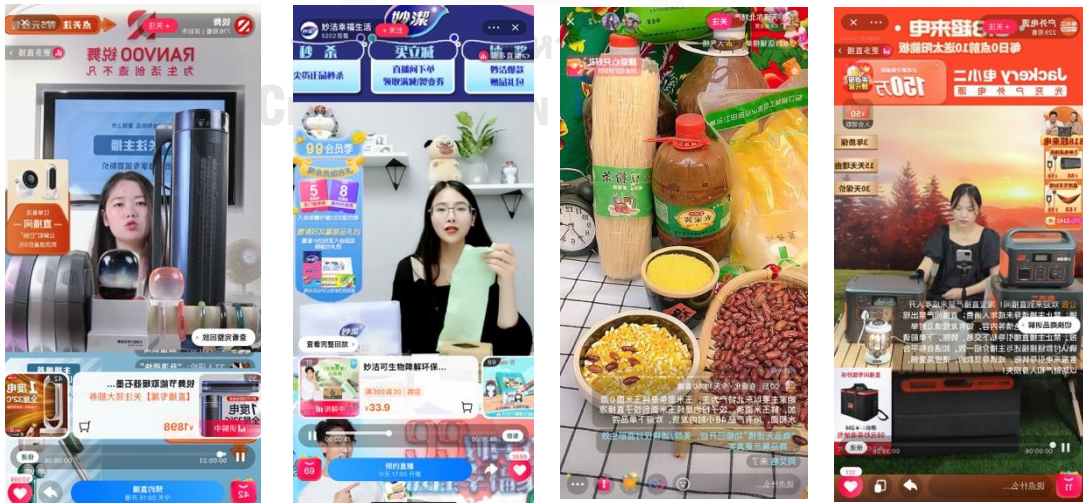
基于技术接受模型下中国人通过直播参与环境营销传播的意愿研究

注:本调查是研究的一部分, 仅供教育用途

在您做调查之前, 研究人员想要为您解释一下研究主题(直播环境营销传播)的定义, 并为您提供一些例子:

直播环境营销传播是指在淘宝、拼多多、京东、抖音、拼多多等平台的直播页面上发布的绿色产品(如环保袋、节能电器、绿色食品等)或绿色内容(如绿色广告、绿色标签等)的实时音频、视频, 涉及环境问题及相关话题。商家和直播者意图告知或说服消费者对环境保护的意识、兴趣和行动, 如废物管理、减少碳排放、污染控制、节约能源等。以下是一些直播环境营销传播的例子:

直播环境营销传播的例子:



(来源: 淘宝直播和抖音直播)

注:从现在起,本问卷将用“直播”一词代替“直播环境营销传播”,含义同上。

第一部分 填写说明:请在您的选项上打勾(√)

1.您的年龄在 18-60 岁之间?

1. 是
 2. 否 (结束调查)

2.您在此之前,是否观看过关于绿色产品的直播购物视频?

1. 有
 2. 没有(结束调查)

第二部分 填写说明:请根据您对下列陈述的看法对其评分

1=非常不同意, 2=不同意, 3=不反对也不赞同, 4=同意, 5=非常同意。

陈述	不同意↔同意				
	1	2	3	4	5
1. 参与直播能帮助我找到更多的卖家(假设我是一个消费者), 或接触到更多的客户(假设我是一个卖家)。					
2. 参与直播能帮助我省钱(假设我是一个消费者), 或增加收入(假设我是一个卖家)。					
3. 在新冠肺炎大流行的背景下, 参与直播能帮助我保护自己、家人和社区的健康。					
4. 参与直播可以增加我的购物效率(假设我是一个消费者), 或销售效率(假设我是一个卖家)。					

第三部分 填写说明:请根据您对下列陈述的看法对其评分

1=非常不同意, 2=不同意, 3=不反对也不赞同, 4=同意, 5=非常同意。

陈述	不同意↔同意				
	1	2	3	4	5
1. 参与直播很容易。					
2. 直播平台中的工具和功能使用方便					
3. 学习如何在直播平台中使用信息技术是很容易的					
4. 我很容易记住如何在直播中执行任务。					

第四部分 填写说明:请根据您对下列陈述的看法对其评分

1=非常不同意, 2=不同意, 3=不反对也不赞同, 4=同意, 5=非常同意。

陈述	不同意↔同意				
	1	2	3	4	5
1. 参与直播对我来说是享受的。					
2. 参与直播对我来说是愉悦的。					
3. 参与直播对我来说很有趣。					
4. 参与直播让我保持开心。					

第五部分 填写说明:请根据您对下列陈述的看法对其评分

1=非常不同意, 2=不同意, 3=不反对也不赞同, 4=同意, 5=非常同意。

陈述	不同意↔同意				
	1	2	3	4	5
1. 我打算参与直播。					
2. 我预测我会参与直播。					
3. 如果我想购买(假设我是消费者), 或出售(假设我是卖家)一款绿色环保产品, 我会首先选择直播平台。					

第六部分 填写说明:请在您的选项上打勾(√)

1. 您的性别是什么?

1. 女性 2. 男性 3. 其他

2. 您每个月的收入是多少?

1. 不超过 3,000 元人民币(不超过 417 美元)
2. 3,000 -5,000 元人民币(约 417 -693 美元)
3. 5,001 – 7,000 元人民币(约 694 -970 美元)
4. 7,001 – 9,000 元人民币(约 971 – 1,248 美元)
5. 超过 9,000 人民币(超过 1,248 美元)

3.您达到的最高教育水平是

1. 高中以下学历
2. 高中或同等学历
3. 本科或同等学历
4. 本科以上学历

4. 职业

1. 学生 2. 员工 3. 企业主 4. 失业 5. 其他

5. 感情状况

1. 单身 2. 恋爱关系(未婚) 3. 已婚 4. 丧偶 5. 离婚

第七部分

1. 您认为能够影响您参与绿色产品直播的原因是?

VITA

NAME Yanfei Liu
DATE OF BIRTH 29 September 1996
PLACE OF BIRTH China



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY