

A Bibliometric Review of User Behaviors Research in Live Streaming Commerce

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ABSTRACT

Live streaming commerce is a novel combination of real-time video and commercial activities. With the rapid popularity of live streaming shopping in current years, researchers have started to investigate user behaviors in live streaming commerce. To fully understand the factors that affected user behaviors (streamers and customers) in live streaming commerce platforms and provide a reference for scholars in future research, this paper summarizes the existing literature on user behaviors in live streaming commerce. First, we searched literature in WOS database and obtained 39 papers that meet the criteria. Second, we conducted a bibliometric review by focusing on descriptive analysis. Finally, this paper looks forward to possible future research topics based on theory, research context, and research content, thus hoping to provide a foundation and new ideas for future research.

Keywords: Live Streaming Commerce; User Behavior; Streamer; Platform

INTRODUCTION

Live streaming commerce is defined as a new form of e-commerce/s-commerce platform that embedded with real-time social interaction (Cai & Wohn, 2019). There are three types of live streaming commerce: (1) live streaming features embedded in e-commerce shopping site or apps (e.g., Amazon ‘Style Code Live’ and ‘Taobao Live’); (2) live streaming platforms incorporating commercial activities (e.g., Liveme and Huya); (3) social networking sites that add live streaming features to facilitate online product sales (e.g. Facebook Live and Douyin Live) (Wongkitrungrueng, Dehouche & Assarut, 2020). The unique characteristic of live streaming is that consumers can interact with sellers in real time, resulting in an immersive, engaging, and interpersonal shopping experience (Wongkitrungrueng & Assarut, 2018). Using live streaming commerce platforms, consumers are presented with both audial and visual messages that attracted their attention, thus, making them well-informed about the product and making purchase decisions on a more rational basis (Wang & Wu, 2019).

In current years, live streaming commerce is experiencing unprecedented growth, especially after the outbreak of COVID-19, in where getting more merchants and brands adopt this platform to engage and cultivate relationship with their consumers (Sun, Shao, Li, Guo & Nie, 2019). In 2020, the report of Statista stated that over two billion people purchased goods or services online, and during the same year, e-retail sales surpassed 4.2 trillion U.S. dollars

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worldwide (Daniela, 2021). In China, there are 617 million live streaming users, accounting for 62.4% of the total internet population in China (CNNIC, 2021). The live streaming sector has swiftly grown into a significant purchasing platform, radically altering the way retailers sell their products via e-commerce or s-commerce. Some local commerce giants like Taobao have boosted sales by collaborating with livestreaming platform Douyin, allowing users to purchase products via their live streaming platforms. Live streaming commerce has risen rapidly in terms of economic value. According to the report in Statista, in 2017, live streaming commerce's gross merchandise volume (GMV¹) in China, accounted for only 2% of the total online shopping's GMV. In 2019 and 2020, the GMV of live streaming commerce in China accounted for 4.5% and 10.2% of total online shopping's GMV, respectively (Ma, 2021a). In the worldwide, live streaming shopping generated \$60 billion in 2019 and almost double in 2020 (Lunn, 2020).

Live streaming commerce is considered as a new phenomenon because it started to grow in recent five years in the academic field. For example, existing papers have studied on user's motivation to shop (Cai & Wohn, 2019), user's engagement in live streaming commerce (Wongkitrungrueng & Assarut, 2018; Sun et al., 2019), or observation of actual behaviours in live streaming platform (Wongkitrungrueng et al., 2020). Therefore, it is timely to conduct a bibliometric literature review to further understand the research insights that published within this context. This would also present a macroscopic overview on live streaming commerce literature to scholars who intends to explore this area. As suggested by Marzi, Dabić, Daim and Garces (2017), bibliometric method is a usefulness technique in the domain of management as it reviewed the articles fully based on quantitative data, reducing reviewers' subjectivity and bias. With this mind, the main objectives of this study are to:

- i. define the concept of live streaming commerce and review basic theories.
- ii. identify the progress on user behaviours research in live streaming commerce by focusing on descriptive analysis at five levels: documents, journal, authors, institutions, and countries.
- iii. suggesting a research agenda for scholars in future live streaming commerce research.

LITERATURE REVIEW

Previous live streaming studies have mainly focused on both e-sports and games (Hilvert-Bruce, Neill, Sjöblom & Hamari, 2018; Sjöblom & Hamari, 2017). However, increasing research has been devoted to live streaming in e-commerce and s-commerce because of its popularity and economic importance to reach, promote, and sell products to customer more efficiently and effectively (Wongkitrungrueng & Assarut, 2018; Sun et al., 2019). In this section, we provide background information on the concept of live streaming commerce and on the basic theories behind live streaming commerce.

Concept of live streaming commerce

Despite absence of a standard definition for "live streaming commerce", this term predominantly refers to providing and carrying out electronic commerce activities and commercial transactions in the context of live streaming (Cai & Wohn, 2019). Hence, by definition, live streaming commerce could be considered as a subset of e-commerce or s-

¹ GMV = Traffic x Conversion Rate x Customer Unit Price.

commerce (Cai & Wohn, 2019; Sun et al., 2019) that is more engaging and user-centric, as it provide a synchronous environment that supports real-time computer-mediated communication between viewer-streamer as well as viewer-viewer (Wongkitrungrueng & Assarut, 2018).

Theories behind live streaming commerce

Major theories

Theories give a road map for scholars to follow in order to solve a research question, consequently, theories are viewed as a tool for advancing scholarly knowledge (Lim, Yap & Makkar, 2021). This meta-review shows that studies on user behaviours in live streaming commerce have so far used a variety of 19 different theories (See Table 1).

Some basic theories that used to explain e-commerce/ s-commerce adoption are widely used in live streaming commerce. For example, the study by Clement Addo, Fang, Asare and Kulbo (2021) adopted both theory of planned behaviour (TPB) and theory of reasoned action (TRA) to explain consumer purchase intention in live streaming commerce. On the other hand, live streaming commerce is inextricably linked with social media, and most researchers adopt theories in mass communication to explain usage behaviour. As presented in Table 1, it can be concluded that that S-O-R model (N=9) and Uses and Gratifications Theory (UGT) (N=6) are two most popular theories adopted in this study context, followed by social presence theory (N=3), media richness theory (N=2), and flow theory (N=2).

In specific, the S-O-R model was developed by Mehrabian and Russell (1974), which described the impact of external influences (i.e., stimulus) on consumers' internal processes (i.e., organism) and how it results on consumer behaviour (i.e., responses). As a macro-theory, S-O-R model has been adopted as the fundamental framework in many articles. For instance, in the context of live streaming commerce, Wongkitrungrueng and Assarut (2018) have adopted this theory to study customer engagement behaviour. Xu, Wu and Li (2020) studied how contextual and environmental stimuli and organism factors that influence consumer behaviour. Kang, Lu, Guo and Li (2020) developed a research model to investigate the dynamic effect of interactivity on customer engagement behaviour through tie strength in live streaming commerce.

While UGT theory was widely adopted to explain social and psychological motivations of particular media use and gratification people got from such use (Katz, Blumler & Gurevitch, 1973). The studies by Hou, Guan, Li and Chong (2019) and Chen and Lin (2018) have adopted this theory to study viewing and usage intention in the context of live streaming commerce, respectively. Ma (2021a) explored user's shopping intention in live streaming commerce. Hsu and Lin (2021) and Hsu, Lin and Miao (2020) have utilized UGT theory to understanding user's continuous intention and loyalty toward live-streaming services, respectively. Chen, Chen and Keng (2020) have adopted this theory to develop a live streaming perceived servicescape (OLSPS), which helps to assess users' cognition and behavioural intention. In summary, from the articles above, user behaviours in live streaming commerce can be divided into four stages: (i) watching behaviour; (ii) engagement behaviour; (iii) purchasing behaviours, and (iv) stickiness behaviour.

For social presence theory, Short, Williams and Christie (1976) defined it as "the extent to which an individual can feel the existence of others through media in a virtual environment". In Liu, Yang and Ling's (2020) research, social presence reflects the perception of personal intimacy, enthusiasm, friendliness, or social interaction in virtual environment. Media richness theory is a framework that explores information transmutability carried by media channels and

users' ability to reproduce the information (Daft & Lengel, 1986). Hsu and Lin (2021) proposed that live streaming commerce possesses high media richness which allows for immediate feedback, cues, language variety, and personal focus. While Chen et al. (2020) operationalized it from four dimensions: speed of communication, multiple cues, language variety, and degree of personalization. Flow theory was defined as "the holistic sensation that people feel when they act with total involvement" (Csikszentmihalyi, 1975). Flow is a mental state in which people are completely immersed filter out other unrelated perception in their current activity. Chen and Lin (2018) use flow as an antecedent that drive live streaming usage intention. Besides, Hsu and Lin (2021) propose interactivity and telepresence as the critical antecedents of flow in the context of livestream services.

Minor theories

From a minor perspective, we can divide the existing studies into two main streams: The first stream focuses on external (environmental) aspects of live streaming commerce, using socio-technical approach, social exchange theory (SET), and trust transfer theory (N=1). While the second stream investigates individual's motives, perceived values or benefits, and antecedents of live streaming adoption by using motivation/value related theory. Those theories grouped under this aspect including, self-determination theory (SDT), construal level theory (CLT), cognitive transactional theory, emotional labour theory, attachment theory, affordance theory, regulatory focus theory (RFT), big five personality traits, and self-congruity theory.

Socio-technical approach highlights on social and technological aspects (Trist, Higgin, Murray & Pollock, 1964). In Li, Li and Cai's (2021) research, they regarded live streaming commerce platform as social technology platform. The study included interaction and identification into social factors, while synchronicity and vicarious expression were used as technical factors. In China society, the relationships based on mutual interests and benefits was known as "guanxi" (Lee, Pae & Wong, 2001). Zhang, Qin, Wang and Luo (2020) adopted SET to understand the concept of swift guanxi between customers and e-retailers. In general, SET theory suggested that positive actions can lead to a customer response and can enhance customers' commitment with the exchange relationship (Emerson, 1981). Trust transfer theory describes that trust can be transferred from one entity to another (Doney & Cannon, 1997). Guo, Hu, Lu and Ma (2021) adopted this theory to explore trust transfer mechanism in the context of live streaming commerce. In their trust transfer mechanism, customer trust included trust in community members, trust in broadcasters, and trust in products.

Self-determination theory is a macro theory that concerns people's inherent growth tendencies and innate psychological needs (Deci & Ryan, 1985). It implied that different types of motivation (intrinsic and extrinsic) occur when people make decisions to engage in an action, which are more or less self-determined based on satisfaction of basic psychological needs (i.e. autonomy, competence and relatedness) (Deci & Ryan, 2000). In Lin, Wang, Wang and Lee's (2021) research, they suggested that both intrinsic and extrinsic motivations share positive relationship with live stream broadcasting intention.

Construal level theory is a theory in social psychology that describes the relationship between psychological distance and the extent to which people's thinking is abstract or concrete (Liberman & Trope, 1998). Zhang et al. (2020) applied the theory and proved that psychological distance negatively affects online purchase intention. On the other hand, cognitive transactional theory is used as a theoretical framework for understanding how individuals participate in a specific organizational activity (Lazarus & Folkman, 1984). Zhou,

Chen and Su (2019a) utilized this theory to develop a challenge-hindrance stress model to explain the mediating effect between social distance and users' broadcasting intention on live streaming platforms.

Emotional labour theory describes the process in which service providers manage their own emotional expressions to achieve emotional states that satisfied with the requirements of the organization (Hochschild, 1983). Most previous research on emotional labour studied the relationship between staff and customers in the offline service industry from seller's perspective, but Shi, Ma and Zhu (2021) measured how the emotional labour of streamer affected user stickiness from user's perspective. Affordance theory states that each environment has the affordance of a specific action (Gibson, 1966). Thus, affordance has different attributes as there are a variety of approaches that will influence user behaviour to achieve certain goals in each environment. The concept of affordance has been widely used to explain relationship between IT and social media. For example, Sun et al. (2019) defined IT affordance of customer purchase behaviour in live streaming platforms from both technical and customer's perspectives, which included visibility, metavoicing, and guidance shopping. Similar to affordance theory, attachment theory describes that individual can create attachments when they are connected to certain objectives (Bowlby, 1979). For instance, Li et al. (2021) adopted platform attachment and emotional attachment to streamers to explain user stickiness behaviour in live streaming shopping platforms.

Self-congruity theory helps to explain facets of consumer behaviour by delivering a more thorough understanding of self-concept (Rosenberg, 1979). Based on the concept of the theory, Park and Lin (2020) proposed that match between self and product would greatly affect customer purchase intention. Regulatory focus theory and big five personality traits are supporting theories for individual differences. Regulatory focus theory investigates the link between a people's motivation and his/her path to achieving the goal. And individuals are characterized into either promotion focus or prevention focus (Higgins, 1998). Shi et al. (2021) examined moderating effect of regulatory focus between emotional labour and user stickiness. Big five personality traits was the model to explore the relationship between personality and individual behaviours (Fiske, 1949). The theory identifies five aspects of personality: Neuroticism; Extraversion, Openness to Experience, Conscientiousness, Agreeableness (Costa & McCrae, 1988). In Xu and Ye's (2020) research, they demonstrated that personality traits and motivations can jointly predict live streaming use.

Table 1: Detailed explanation of theoretical foundations

Theory	Theory statements	References
Affordance theory	Proposed by Gibson (1966), affordance theory states each environment has the affordance of a specific action.	Sun et al. (2019)
Attachment theory	Based on attachment theory proposed by Bowlby (1979), individuals can create attachments when they are linked to certain goals.	Li et al. (2021)
Big Five personality traits	Developed by Fiske (1949), big Five personality traits was the model to explore the relationship between personality and individual behaviours. The theory identifies five aspects of personality: Neuroticism; Extraversion, Openness to Experience, Conscientiousness, Agreeableness.	Xu & Ye (2020)

Cognitive transactional Theory	Lazarus & Folkman (1984)'s cognitive transactional Theory is used as a theoretical framework for understanding how individuals engage in a certain organizational activity.	Zhou et al. (2019a)
Construal level theory (CLT)	Developed by Liberman and Trope (1998), CLT defines the relationship between psychological distance and how abstract or concrete people's thinking is.	Zhang et al. (2020)
Emotional labour theory	Hochschild (1983) first proposed the concept of emotional labor, describing the process in which service providers manage their own emotional expressions to achieve emotional states that meet the requirements of the organization.	Shi et al. (2021)
Flow theory	Developed by Csikszentmihalyi (1975), flow theory describes "the holistic sensation that people feel when they act with total involvement".	Hsu & Lin (2021); Chen & Lin (2018)
Media Richness Theory	Introduced by Daft and Lengel (1986), media richness theory is a framework that explores information transmutability carried by media channels and users' ability to reproduce the information.	Hsu et al. (2020); Chen et al. (2020)
Regulatory focus theory (RFT)	Formulated by Higgins (1997), regulatory focus theory examines investigates the link between a people's motivation and his/her path to achieving the goal (i.e., promotion focus or prevention focus).	Shi et al. (2021)
Self-congruity theory	Introduced by Rosenberg (1979), self-congruity theory helps to explain and forecast facets of consumer behavior by delivering a more thorough understanding of self-concept.	Park & Lin (2020)
Social exchange theory (SET)	SET describes that positive actions can elicit customer response and strengthen customer's engagement to the exchange connection (Emerson, 1981).	Zhang et al. (2020)
Social presence theory	Introduced by Short et al (1976), social presence was defined as "the extent to which an individual can feel the existence of others through media in a virtual environment".	Liu et al. (2020); Chen et al. (2020); Chen & Xiong, (2019)
Socio-technical approach	Socio-technical approach is a way that consider both social and technological aspects (Trist et al., 1964).	Li et al. (2021)
Stimulus-organism-response (SOR)	Developed by Mehrabian and Russell (1974), SOR model described the impact of external influences (i.e., stimulus) on consumers' internal processes (i.e., organism) responding to the stimulus, and resulting consumer behaviour (i.e., responses).	Chen et al. (2020); Chen, Zhang, Shao, Gao & Xu (2021); Zhou, Zhou, Ding & Wang (2019b); Wongkitrungrueng & Assarut (2018); Xu et al. (2020); Hu & Chaudhry (2020); Ming, Zeng, Bilal, Akram, & Fan, (2021); Lee & Chen (2021); Kang et al. (2020)

Self-determination theory (SDT)	Introduced by Deci & Ryan (1985), SDT is a macro theory of human motivation and personality, which focus on individual's innate psychological needs and inherent growth tendencies.	Lin et al. (2021)
Theory of planned behaviour (TPB)	Proposed by Ajzen (1985), TPB is a psychological theory that links beliefs to behavior. The theory maintains that three core components: attitude, subjective norms, and perceived behavioral control.	Clement Addo et al. (2021)
Theory of reasoned action (TRA)	Proposed by Fishbein & Ajzen (1975), TRA describes that a person's behavior is governed by their intention to execute the activity, which is a result of their attitude toward the behavior and subjective norms.	Clement Addo et al. (2021)
Trust transfer theory	Trust transfer occurs when the trustor bases his or her trust in the trustee on his or her trust in some other related targets (Doney & Cannon, 1997).	Guo et al. (2021)
Uses and gratification theory (UGT)	UGT theory describes social and psychological motivations of particular media use and gratification people got from such use (Katz et al., 1973).	Chen et al. (2020); Hsu & Lin (2021); Hsu et al. (2020); Hou et al. (2019); Ma (2021b); Chen & Lin (2018)

METHODOLOGY

Search strategy

To gain insights into the trend of user behaviours in live streaming commerce, we conducted a bibliometric analysis in Web of Science (WOS) database. WOS database is the most widely accepted and frequently used search engine for analysis of scientific publications (Liu, Zhan, Hong, Niu, & Liu, 2013). This paper adopts the following steps to retrieve and collect existing literature on live streaming commerce. First, we gathered various expressions of live streaming commerce and determined the retrieval keywords: "live stream*", "live-stream*", "live broadcast*". Second, as live streaming commerce is an emerging domain in current years, we refine the search period in the past five years, which only included research articles published between 2017 and 2021 (see Table 2). Any papers with these keywords identified in the title, abstract, or keyword list were included for this study based on several inclusion and exclusion criteria explained in the next section.

Table 2: Summary of data source and selection

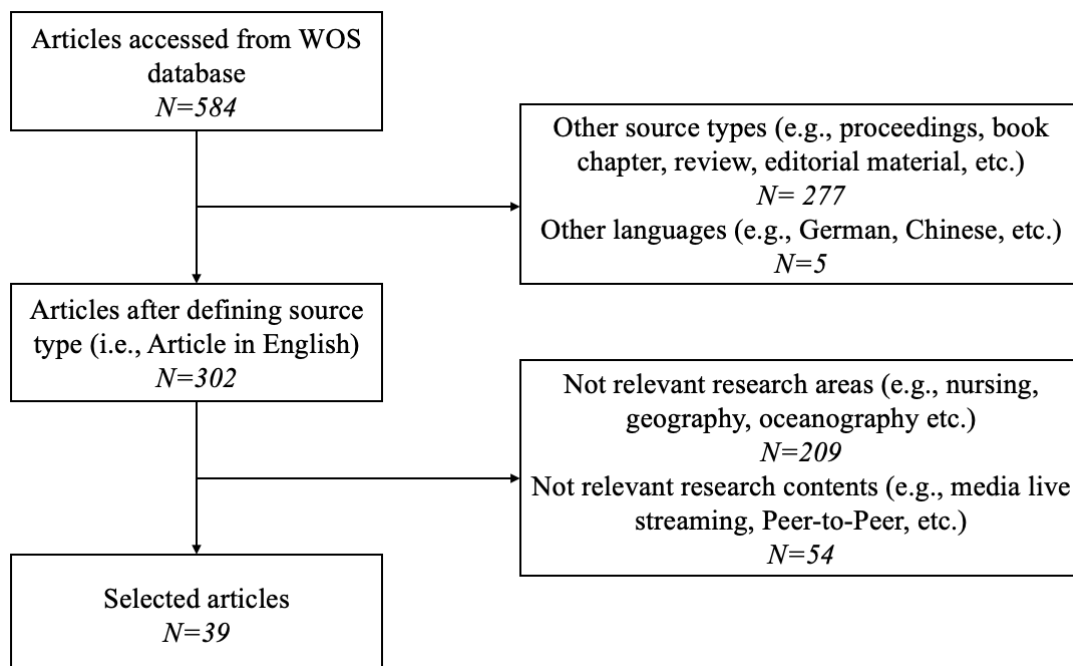
Data source	Web of Science
Citation indexes	SSCI/SCIE/ESCI
Searching period	2017-2021
Searching keywords	"live stream*" OR "live-stream*"OR "live broadcast"
Document types	Article
Language	English
Sample size	39

A total of 584 research papers were accessed from WOS database using the specified keywords. The following criteria were applied to filter the results:

- (i) Only included academic journals, as they provide great contribution to scholarly advancement and undergo rigorous peer review (Paul, Merchant, Dwivedi & Rose, 2021). In other words, proceedings, book chapter, review and editorial materials were excluded.
- (ii) Only included articles published in English language and excluded other languages such as Germany, Chinese, etc.
- (iii) Only included articles that published in business and management area. Excluded those irrelevant areas, such as geography, oceanography, etc.
- (iv) Only included live streaming commerce research papers. Those irrelevant research contents such as media live streaming, peer-to-peer, etc. were excluded.

As a result, a total of 39 articles was included for further review after removing those irrelevant articles (n=545) (refer Figure 1).

Figure 1: Procedure and criteria in selecting articles from WOS and Scopus databases



RESULTS AND DISCUSSION

The bibliometric overview of live streaming commerce is presented in a descriptive analysis at five different levels that is (a) publications, (b) journals, (c) authors, (d) institutions, and (e) countries. Each of these levels are analysed using descriptive metrics, for publication level, the number of publications, number of citations, most cited articles will be analysed; for journal level analysis, most cited journals are presented using the bibliographic data of search period; for authors level, author members per paper and leading authors will be presented; last level is analysis of leading institutions and leading countries. Through searching and screening, the sample in this study was comprised of a total of 39 publications by 104 authors affiliated with

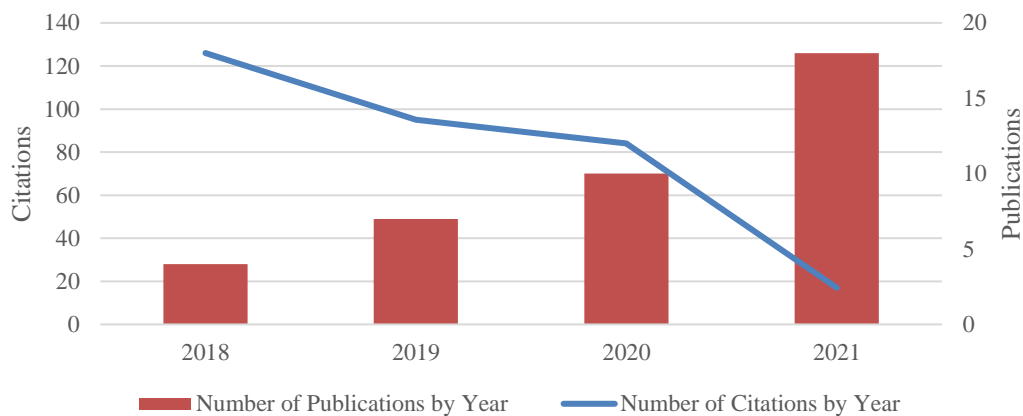
58 institutions in 9 countries, which were published in 27 journals and referred 2936 cited references (see Table 3). Sorting through the existing research, we found that there was no publication in 2017, Chen and Lin (2018) were early scholars who studied live streaming commerce research through empirical study. Besides, Taobao.com was a commonly used research platform, although some scholars also conducted research on Amazon, Facebook, JD.com, and other such platforms.

Table 3: Summary of general result

Criteria	Quantity
Publications	39
Citations	317
Journals	27
Institutions	58
Countries	9
Cited references	2936

Analysis of Publications

Publications and citations are commonly considered measures of productivity and impact, respectively (Svensson, 2010). To illustrate the productivity and impact of the live streaming commerce research, Figure 2 presents a visual summary of the temporal distribution of the publications and citations by years. In terms of publications, since live streaming commerce is an emerging topic in current years, the productivity of this topic is not very high. In 2018, there was only four papers available in WOS database. Subsequently, the number of publications is increasing and accumulated to 39 articles, which display the importance and huge potential of this topic. In terms of citations, articles in 2018 had the most citations with 126 in comparison to the other three years, but citations were keeping decrease from 2018 to 2021. From 2019 to 2021, due to the outbreak of COVID-19, a large number of articles was delayed in publishing, where those papers have not received any issue and volume number. Besides, most articles would not cite newly published work, instead, they cited latest conference paper. Moreover, because live streaming commerce is a new field of study, most researchers build their framework by borrowing theories from other domains (e.g., psychology, communication, branding, etc.). Consequently, they referenced more articles from other fields, citations in live streaming commerce dropped. To date, the accumulated number of citations of articles related to live streaming commerce stand at 317. Although live streaming commerce is a flourishing practical field, academia has paid unequal attention to it. There are still two months left before 2021 ends, 2021 and onwards can be postulated as another phase where live streaming commerce will grow as one of the most critical topics by citation structure.

Figure 2: Number of publications and citations over the years

Citation count indicates the influence of a document (Svensson, 2010). In order to identify the most influential publications, Table 4 presents a list of the 10 most cited documents. These 10 papers (25% of a total of 39 publications) account for 315 citations in total (80% of a total of 404 citations). Those leading articles analysed various key issues pertaining to the conceptual framework of watching, engaging, and shopping behaviours in live streaming commerce, understanding the endorsement effects of streamers/influencers, and consumers' attitudes toward live-stream content.

The most cited article was “What drives live-stream usage intention? The perspectives of flow, entertainment, social interaction, and endorsement”, published by Chen and Lin (2018) in *Telematics and Informatics*, which is a Q1 journal with impact factors of 6.182. Followed by Sun et al.'s (2019) article: “How live streaming influences purchase intentions in social commerce: An IT affordance perspective” and Wongkitrungrueng and Assarut's (2018) article: “The role of live streaming in building consumer trust and engagement with social commerce sellers”, with 36 citations and 31 citations, respectively. Paper by Chen and Lin (2018) dig out some motivations (flow, entertainment, social interaction, and endorsement) that drive user's watching behaviours and explored gender differences in watching live streaming events. In contrast, the work of Wongkitrungrueng and Assarut (2018) published in *Journal of Business Research* (Q1, IF: 7.55), goes beyond customer motivation and experience of users with respect to entertainment, who examined customers' perceived value of live streaming, customer trust, and engagement behaviours. Among the other influential works, Sun et al.'s (2019) work is ranked as third highest based on citations per year. This paper was published in *Electronic Commerce Research and Applications* (Q1, IF: 6.014) develop a different research model emphasizing IT affordance and customer engagement, which later translates into shopping behavioural. These articles are quite representative for three types of user behaviours in live streaming commerce, which made them to be the most cited articles.

Table 4: Top 10 most cited publications

Article Title	Authors	Year	Citations
What drives live-stream usage intention? The perspectives of flow, entertainment, social interaction, and endorsement	Chen & Lin	2018	57
How live streaming influences purchase intentions in social commerce: An IT affordance perspective	Sun et al.	2019	36

The role of live streaming in building consumer trust and engagement with social commerce sellers	Wongkitrungrueng & Assarut	2018	31
Gender and live-streaming: source credibility and motivation	Todd & Melancon	2018	24
The effects of match-ups on the consumer attitudes toward internet celebrities and their live streaming contents in the context of product endorsement	Park & Lin	2020	23
The impact of live video streaming on online purchase intention	Zhang et al.	2020	17
Factors influencing people's continuous watching intention and consumption intention in live streaming Evidence from China	Hou, Guan, Li, & Chong	2019	17
The magic of danmaku: A social interaction perspective of gift sending on live streaming platforms	Zhou et al.	2019b	13
Understanding the impact of social distance on users' broadcasting intention on live streaming platforms: A lens of the challenge hindrance stress perspective	Zhou et al.	2019a	10

Analysis of Journals

According to Dzikowski (2018), a journal is more impact if the more the number of papers published on it and the more the number of citations it possesses. Therefore, this study analysed the number of publications and citations of all journals. A total of 15 journals are selected because they are account for 98% of the total citation. Table 5 ranked the selected journals based on publications, citations, and average citation per publication of the journals. The data reveals that the Journal of Business Research is the most influential journal, with 31 citations per articles. In terms of productivity, Internet Research (N=5), Telematics and Informatics (N=3) and Electronic Commerce Research and Applications (N=3) are three most popular journals for publish with the highest number of published articles.

Table 5: Top 15 important journals

Rank	Source Title	Publications	Citations	ACP ¹
1	Journal of Business Research	1	31	31.00
2	Journal of Research In Interactive Marketing	1	24	24.00
3	Telematics and Informatics	3	68	22.67
4	Electronic Commerce Research and Applications	3	55	18.33
5	Journal of Retailing And Consumer Services	2	26	13.00
6	Cyberpsychology Behaviour And Social Networking	1	10	10.00
7	Chinese Journal of Communication	1	9	9.00
8	Journal of Marketing Management	1	9	9.00
9	European Journal of Marketing	1	9	9.00
10	Service Industries Journal	2	17	8.50
11	International Journal of Information Management	1	8	8.00
12	Multimedia Tools and Applications	1	8	8.00
13	Journal of Electronic Commerce Research	1	6	6.00
14	Internet Research	5	29	5.80

15	Journal of Services Marketing	1	3	3.00
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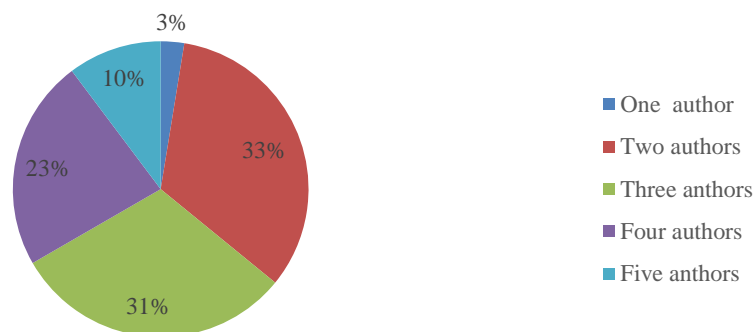
ACP¹: Average Citation Per Publication

Analysis of Authors

Figure 3 depicts the distribution of publications according to the number of contributing authors. From the result, we see that the maximum number of authors per article is five and the minimum number of authors per article is 1. It shows that 3% (1 out of 39) of publications are by a single author, while 97% (38 out of 39) publications are co-authored by two to five authors, after calculation, we find that the average number of authors per article is 3.

Figure 3: Author members per paper

Author members per article



Academic research is largely dependent upon collaboration and typically involves interactions among scholars, universities, and countries (Finardi & Buratti, 2016). In the following descriptive analysis, we will present most cited authors, institutions, and countries respectively. Table 6 depicts the most productive authors in terms of their publications and citations. For these authors, the table reports the number of cited publications, total citations, and average citations per cited publication. Firstly, when sorting by average citations per cited publication, Chen Chia-Chen is the leading author with the highest citations. He is followed by Todd Patricia R (24) and Park Hyun Jung (23). Secondly, in terms of number of publications, Sun Yuan, Wongkitrungrueng Apiradee, Zhang Min, and Hsu Chin-Lung have published two articles, while other authors only have one paper. Thirdly, when sorting by total citations, Chen Chia-Chen has the highest citations (57), followed by Sun Yuan (42) and Wongkitrungrueng Apiradee (40).

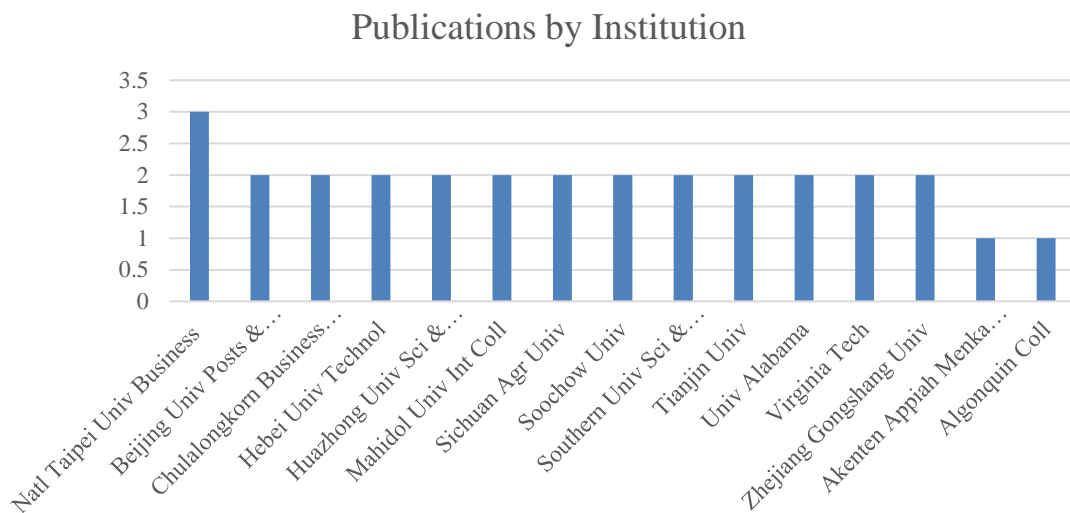
Rank	Authors	Publications	Citations	ACP
1	Chen Chia-Chen	1	57	57
2	Todd Patricia R	1	24	24
3	Park Hyun Jung	1	23	23
4	Sun Yuan	2	42	21
5	Wongkitrungrueng Apiradee	2	40	20

6	Hou Fangfang	1	17	17
7	Zhou Jilei	1	13	13
8	Zhang Min	2	20	10
9	Zhou Fei	1	10	10
10	Hsu Chin-Lung	2	10	5

Figure 3: Author members per paper

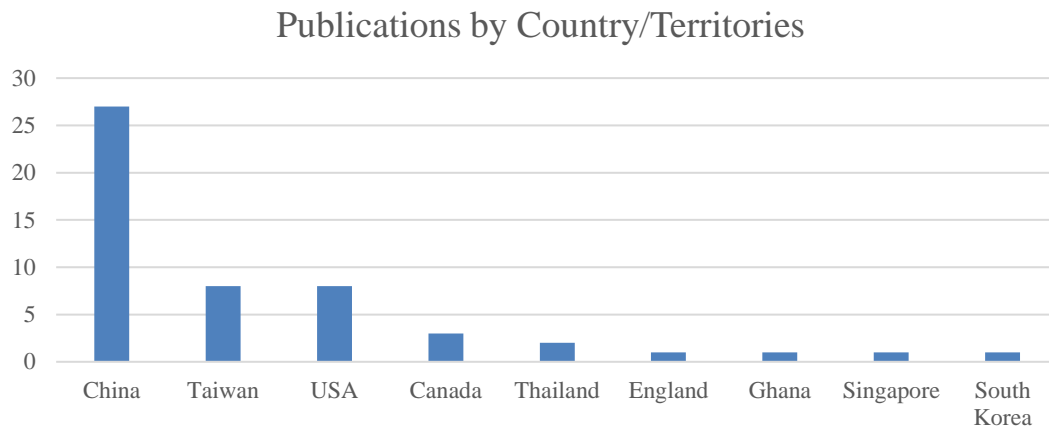
Figure 4 presents top 15 leading institutions in terms of their publications. National Taipei University of Business is the most productive institution in terms of publications (N=3). There are 12 institutions have published two articles, such as Beijing University of Posts and Telecommunications, Huazhong University of Science and Technology, Chulalongkorn Business School etc.

Figure 4: Leading institutions



Analysis of Countries

The number of documents published by each country in the collection describe the impact of the most productive countries in the analysed research area (see Figure 5). Based on the data in Figure 5, China accounting 52% of total production in the area of live streaming commerce, followed by an equal percent (15%) from Taiwan and USA (15%). In total, these three countries are achieving over 80% of total production in live streaming commerce research. In practice, China is the first place where live streaming shopping become popular. Since Alibaba group launched Taobao Live in 2016, China has been moving forward with the development of a sophisticated live-streaming ecosystem. With a shift in content consumption behaviour brought on by the COVID-19, live streaming shopping platforms have exploded in popularity and have attracted many researchers to this field. Thus, it can be the reason to explain why China is the most productive countries in this research field.

Figure 5: Leading countries

CONCLUSION AND IMPLICATIONS FOR RESEARCH

This study contributes to live streaming commerce literature by providing a comprehensive review of 39 studies. We firstly defined the concept of live streaming commerce and reviewed 19 basic theories. From the reviewed articles, stimulus-organism-response and uses and gratification theory are the most popular theories that adopted by most researchers. Besides, theories can be divided from two broad streams, one is to study from environmental perspective (e.g., cultural, social, or technical), the other way is to study from individual's perspective, investigating antecedents or moderators of live streaming commerce. Main topics of live streaming commerce included watching, engagement, purchasing, and stickiness behaviours.

Secondly, by conducting a bibliometric review, we summarized and synthesized the results of 39 academic publications on live streaming commerce adoption and presented descriptive analysis at five different levels, that is, number of publications and citations, most cited articles; most cited journals; number of authors per publications, leading authors; leading institutions; and leading countries.

Several implications for future research were discussed. First, most theories applied in the research are served as part of their research framework. Most of them use a single theory in their research, scholars are suggested to integrate various theories from different disciplines (i.e., psychology, sociology, information system) to further discuss user behaviours in live streaming commerce. Secondly, this study finds that 2021 was the most productive year for live streaming commerce research, but the citation counts still low. In viewing live streaming commerce is an emerging research area, it is necessary for research to further explore on how different strategies employed by marketers (i.e., sending gifts, offer exclusive deals, etc) can influence consumers behaviours via live streaming. Third, in the list of most cited journal, Journal of Business Research have the highest average citation per publication, while Internet Research is the most productive journal in this research area. Besides, we find that most of the leading journals in the list are high quality journals with high JIF. Fourth, contributions from the China dominate by a large margin over contributions from the US, Taiwan, Canada, Thailand, and UK, which rank successively in the contribution ranking. Besides, 5 out of 10 leading authors in this research area are link with China. Most of the current research are carried in China, therefore, future studies can extend the extant literature by exploring live streaming commerce in other cultural contexts (non-Asian context).

LIMITATIONS

Similar to other research studies, this study has several limitations. First, the data for the study were collected from only WOS database. In future studies, some well-known databases, such as, Scopus, ProQuest, and ScienceDirect could be included to collect data. Second, this study limits on one document type (article), hence future studies can also analyse books, conference papers, and other publications. Third, researchers can apply advanced bibliometric analysis, including co-citation, co-authorship, co-word analysis, author keyword word-cluster analysis, and global and local citation score analysis to better understand user behaviours in live streaming commerce or other relevant disciplines.

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