



A systematic literature review on social commerce: Assessing the past and guiding the future

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ABSTRACT

The development of technology and social media offers the opportunity for social commerce to emerge with new phenomena in the market. Numerous studies were addressed to gain an understanding of social commerce, and many reviews have generated findings from existing literature on social commerce. However, since social commerce has grown rapidly in recent years, it is vital to incorporate new clues from current research in this field. This study provides a systematic review of social commerce and online consumer behavior. We used the literature search strategy method to explore new features of social commerce by collecting, reviewing, and synthesizing research published from 2017 to 2021. Throughout our paper, the Stimulus-Organism-Response (SOR) framework has been adopted to understand the factors influencing consumer behavior, how consumers perceive social commerce factors, as well as the responses and activities of social commerce. We provide the result with a clear view of social commerce and consumer behavior by identifying the stimulus, organism, and response of social commerce.

1. Introduction

The emergence of social commerce has contributed to the transformation of technology in various ways in people's daily lives, including how they communicate, live, find entertainment, and even run their businesses (Adamopoulos et al., 2018). In recent years, social media such as Facebook, Twitter, and Instagram, among others, have been identified as the most interactive platforms online (Lin et al., 2019). Furthermore, due to the wide adoption of Web 2.0 technologies to support online interactions, social commerce has become a popular consumer tool to share socialized commercial information regarding products and services (Hu et al., 2019). For example, live-streaming commerce has grown in both numbers of viewers and sales revenue. According to China Internet Network Information Center (CNNIC) 2021 Report, China's live-streaming commerce market size reached 6.38 billion users in June 2021 (CNNIC, 2021). Moreover, the Tianmao live-streaming platform reached a GMV of 5,403 billion yuan at the "6.18" online shopping carnival in 2021, which has enormous social and economic influence (Singh et al., 2021).

The first adoption of the social commerce concept occurred in the late 1990s (Busalim and Hussin, 2016), when two e-commerce magnates, eBay and Amazon, introduced new features for online opinion

exchange among users—i.e., posting reviews or rating product performance online. With the emergence of social media, the development of Web 2.0, and the popularity of mobile use, marketers have continued to provide opportunities for consumers to enrich their shopping experience based on social and interactive activities (Adamopoulos et al., 2018). For example, by shopping in real-time broadcasting mode, consumers can view, discuss, and shop for products on live-streaming apps or e-commerce platforms with live-streaming features (Xu et al., 2020). As well as live streaming, videos with Danmu (bullet-screen comments) are becoming prevalent among online consumers; these comments can entice users toward a product or a brand and arouse purchase intention (Fang et al., 2018). Moreover, group buying has emerged as a new form of online purchasing—social community commerce—where consumers can make purchases within their social media communities. This form includes more characteristics of social interaction compared to traditional group-buying forms, for example, Mereta.com and Mobshop.com (Poretski et al., 2020).

Social commerce has attracted much attention from academics. Scholars have researched social commerce from different aspects, and most of them have conducted empirical research on this topic. For example, some literature has investigated the factors of social commerce affecting consumer behaviors (Chen et al., 2018; Hu et al., 2019; Chen

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et al., 2020), with others more closely exploring consumer interactions and communications in the social commerce context more (Xue et al., 2020; Lin et al., 2019; Wang et al., 2020; Dong and Wang, 2018). Also, there are many literature reviews in this field that have summarized the development of social commerce over the past few years (Lin et al., 2017; Chan et al., 2017; Hu et al., 2019; Lam et al., 2019). However, given the development of new technologies such as artificial intelligence (AI), social commerce study is more diverse. For instance, the IT-based emergence of social commerce is evident in live-streaming commerce, Danmu, and other new forms of online trading (Sun et al., 2019). Being aware of new insights and rules in the field of social commerce is key in being able to seize opportunities to learn about peoples' evolving perceptions regarding the uses of new social commerce features and how users perform in the new light of social commerce. In addition, such information is useful in guiding future research on social commerce as it proceeds based on emerging technologies. Without thoughtful guidance in this area, gaining deeper insight into social commerce-driven analysis is difficult to obtain.

To fill in this gap, our paper provides a conceptual framework for examining the effectiveness of social commerce based on the Stimulus–Organism–Response (SOR) model. We first review and analyze existing empirical literature on social commerce within the past five years, from 2017 to 2021. Previous literature reviews regarding this issue have looked mostly at work published up to 2016. The literature we selected addresses three main themes: 1) factors driving social commerce activities, 2) effects or consequences of these driving forces in the social commerce context, and 3) consumer response processes in social commerce. Then, we analyze different regions that have conducted social commerce-related studies. Finally, we propose a picture of a future diagram devoted to the technology-based development of social commerce research.

We expect our paper to add knowledge to both research and practice in social commerce studies. By contributing to social commerce academic research with a background of new insights in this area, researchers can use this work to further explore and explicit more issues to make it a reference model for social commerce. From a practical perspective, enterprises can maintain their competitiveness not only in terms of updating the way of doing business with a focus on social commerce features but also in terms of providing more opportunities for consumers in social interactions.

Accordingly, the primary objectives are:

- (1) To synthesize the relevant articles from multiple elements that generate an overall understanding of new insights into social commerce; and
- (2) To present a theoretical framework covering the literature from several fields of study to identify the major knowledge gaps in the area of social commerce.

2. Literature review

According to a systematic literature review on social commerce-related studies, it is found that social commerce has been widely explored by previous research.

2.1. Definition of social commerce

According to systematic literature on social commerce, social commerce has different meanings due to a variety of research areas (Busalim and Hussin, 2016). The most general definition identifies social commerce as the use of social media or social networks to enable user participation in product selling, information sharing, and shopping in the online marketplace (Dong and Wang, 2018). While with the evolution of social commerce recently, greater interactivity among consumers has been established using live streaming commerce, DanMu interaction, group buying, and community commerce (Cai and Wohn, 2019; Xu

et al., 2019). Although social commerce is defined as a subset of e-commerce, it is revealed by prior literature that social commerce still has many inconsistencies with traditional e-commerce. A definition provided by IBM explains that social commerce is the marriage of e-commerce and e-word-of-mouth (e-WOM) (Zhang and Benyoucef, 2016), which brings about the understanding of user-generated content and social interaction among the online community.

2.2. New trends of social commerce

Research on social commerce began in the last decade, while the number of articles for social commerce research increased exponentially with the emergence of technology development. There are two main streams of research in social commerce literature. The first stream of research focuses on the social behavior of consumers. For instance, Godinho et al. (2016) introduced the time pressure on consumers' decision-making process. Sun et al. (2019) indicated that social sharing is increasingly enabled by technology, and it is necessary to embrace social sharing on online social platforms. Hsu (2020) explored that online vloggers focused on the *para*-social interactions of their viewers. The second stream of research examined the buying behavior or buying intention of consumers in the social commerce context. For instance, Wu et al. (2016), Zhang et al. (2018), and Chen et al. (2018) introduced the factors that affect consumers' online impulse buying behaviors (i.e., website cues, online reviews, atmospheric cues, product presentation and so on). Some other studies explored the consumer perceptions that affect online buying behaviors, such as Setyani et al. (2019) investigated the psychological mechanisms that consumers' buying behavior, Hollebeek and Macky (2019) discussed consumers' engagement, trust, and value in affecting online impulse buying, and Wu et al. (2020) defined consumers' perceived risk and built an expectation-confirmation model in online purchase behavior.

2.3. Main themes in social commerce

We identified the main themes of social commerce from current literature as impulsive buying behavior, live streaming, community commerce, and Danmu culture. The first theme is impulsive buying behavior, most of the studies on this theme are discussing impulsive purchase intentions or behaviors of consumers and investigate the factors causing these behaviors, such as trust, loyalty, and motivations on the consumers' purchase journey (Cai et al., 2018; Lee and Cho, 2019; Molinillo et al., 2020). The second theme is live streaming. Studies on live streaming include two aims: one is to discuss the phenomena of live streaming, and the other is to explore online shopping behavior in the live streaming context (Hu et al., 2017; Cai and Wohn, 2019; Xu et al., 2019). The third research theme is named community commerce, which is related to online community research and explores the relationship between online community users (Mo and Li, 2018; Wongkitrungrueng and Assarut, 2020). The next theme is social sharing, this theme is related to the studies that provide discussion on the social sharing behaviors in social commerce, such as in live streaming videos, on social media platforms, and so on (Xiang et al., 2016; Xu et al., 2019; Xu et al., 2020). The last research theme is the Danmu culture, which is the floating comments in videos and live streaming. The related studies explored the Danmu types, users' motivation to participate in Danmu, and the impacts of Danmu in social commerce (He et al., 2018; Fan et al., 2018; Wang et al., 2019).

3. Theoretical framework

The existing research on social commerce focuses on factors, perceptions, and effects of behaviors. Studies in social commerce research use a broad array of theories. Some researchers have adopted some important theories to explain the behavior of online consumers in social commerce, such as the flow theory (Chen et al., 2018), *para*-social

interaction theory (Leeraphong and Sukrat, 2018; Chen et al., 2018), latent state-trait theory (Chen et al., 2018; Zafar et al., 2019), social influence theory (Hu et al., 2017), and social capital theory (Liu et al., 2019). These theories have provided for a more in-depth analysis of SOR cues toward online consumer behaviors in the social commerce context. Among the theories discovered in social commerce research, the most

Table 1
Summary of theory.

Theories	Description	Authors
Stimulus-Organism-Response Model (SOR)	This model describes whether the stimulating cues (stimulus) perceived by consumers or users (organism) will lead to a certain behavior or performance (response).	Chan et al., 2017; Xu et al., 2020; Hu et al., 2017; Leong et al., 2018; Hu and Chaudhry, 2020; Kang et al., 2021
Para-Social Interaction	This theory applies to the situation where users communicate with others on social media platforms, especially with online celebrities or traders.	Leeraphong and Sukrat (2018); Chen et al., 2018; Zhao et al., 2021
Latent State-Trait Theory	This theory indicates that consumers' behaviors are based on reactions caused by specific personal traits or environmental characteristics within individual consumers.	Chen et al., 2018; Zafar et al., 2019
Social Influence Theory	This theory explains an individual's attitude, thoughts, or behavioral changes due to interaction with another individual or group.	Hu and Chaudhry, 2020
Social Capital Theory	This theory describes how users are influenced by others' opinions and then react to their behaviors in social-networking environments.	Liu et al., 2019
Social Identity Theory	This theory concentrates on an individual's self-identity, roles, and social interactions online.	Hou et al., 2020
Commodity Theory	The theory indicates the need for product uniqueness.	Chung et al., 2017
Psychological Reactance Theory	The theory explains users' reactions a psychological way according to the online environment, especially on scarcity.	Chung et al., 2017
Signaling Theory	This theory provides a framework to understand the internal mechanism between users and traders to transfer qualified information (signal) and proceed with purchase.	Chen et al., 2018
Flow Theory	This theory enables consumers to experience flow in computer-mediated contexts.	Chen et al., 2018
Technology Acceptance Model	This theory is employed among users to provide a necessary understanding of the way people use and adapt to technology.	Cai and Wohn, 2019
Cognitive Response Theory	This theory suggests that if the information is perceived as credible by individuals, the value of the information will increase.	Kang et al., 2021
Arousal Theory	This theory indicates that an individual's state of arousal can be affected by a variety of stimuli.	Zhang et al., 2021

used is the SOR model (Chan et al., 2017; Xu et al., 2020; Hu et al., 2017; Leong et al., 2018; Hu and Chaudhry, 2020; Kang et al., 2021). Table 1 provides a summary of the main theories adopted in the research of existing social commerce.

The SOR model is likely the most popularly used theoretical model to investigate consumer behaviors in the social commerce context. In this paper, we used the SOR model as a framework, which can be a roadmap for further exploring and explicating more issues in social commerce research. This is possible because the SOR model is a comprehensive model which contains almost all relevant findings so far in the social commerce context, also it clearly explains how consumers' behaviors are influenced by environmental or situational cues and how those factors are perceived by consumers (Chan et al., 2017; Chen and Yao, 2018). Existing studies have adopted this model to understand the role of environmental stimuli and their effects on consumers' perceptions and reactions leading to the resulting response (consumer behavior). This model contains the following three main aspects: 1) stimulus (S), normally environmental cues that trigger consumer behaviors; 2) organism (O), consumers' evaluations of perceived stimuli; and 3) response (R), the combination of evaluation of and reaction toward stimuli (Table 2).

After we reviewed the 56 identified papers, we extracted elements relevant to the SOR framework of social commerce. We consolidated the factors of social commerce as a stimulus and explore the reaction of consumers in the social commerce context, including live-streaming commerce, community e-commerce, and so on. Finally, we evaluated the outcomes of consumers and their behaviors. Fig. 4 provides a detailed framework of social commerce based on the SOR model.

4. Methodology

For this study, we conducted a systematic literature review by consolidating extant knowledge regarding social commerce and the associated factors of online consumer behavior. Systematic literature, as defined by Kitchenham and Charters (2007), is a process of identifying, searching for, and evaluating relevant literature to address unanswered research questions. The systematic review approach is driven by gathering evidence from current research based on relevant phenomena, thus gaining an understanding of methods used in this area and the related theoretical foundations; this is done to identify research gaps and discover opportunities for future research. Therefore, to explore the main characteristics of extended social commerce research and discover the underlying inter-relationship between social commerce and technology, it was necessary to implement a systematic review for our study. In keeping with Kitchenham and Charters (2007), such a systematic review should include the following stages: 1) the development of a literature search strategy; 2) the identification of inclusion and exclusion criteria, and 3) the introduction of the study selection process and assessment. In the proceeding section, we outline our research steps in detail.

4.1. Literature search strategy

Based on Kitchenham and Charters' study (2007), developing a literature search strategy is the first stage of the systematic review and is a tool to enable effective and targeted searching for articles and reduce

Table 2
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> The Paper's main topic is a social commerce The paper should be published between 2017 and 2021 The Paper selected is an empirical study 	<ul style="list-style-type: none"> Paper theme is not focused on social commerce/live-streaming commerce/community commerce Paper is outdated

research bias. The search strategy includes two steps before getting to initial paper searching: keyword scanning and journal identification. Based on using numerous keywords—such as “social commerce”, “s-commerce”, “F-commerce”, “Facebook”, “live streaming commerce”, “online”, “Danmu”, “online community” and “urge to buy”—we grounded our research in empirical social commerce studies published in the five years from 2017 to 2021. We searched for some available peer-reviewed academic publications that contain those above keywords in their titles, abstracts, or author-supplied keywords from Business Source elite databases such as Science Direct, EBSCO, Springer, Scopus, Inderscience, Google Scholar, Sage, Wiley, Elsevier, Emerald, and AIS Electronic Library, which provide a wide range of scholarly business, management, and information systems journals. The reason why we focused on these three areas is that they are most relevant to social commerce studies. After scanning the abstracts of the relevant articles, we identified 107 articles in total for our analysis. Because we aimed to assess current social commerce studies about future trends, we restricted our review to empirical studies given that they investigate the latest trends in social commerce research and the effects of and responses to behaviors. The full process of our literature search strategy is provided in Fig. 1.

4.2. Identifying inclusion and exclusion criteria

To ensure the papers selected through the keyword scanning and journal identification process were relevant to our study, we performed the necessary step of identifying inclusion and exclusion criteria

(Webster and Watson, 2002). We focused on English journals and conference proceedings because these two channels cover most research in this field. Eligible papers were published between 2017 and 2021, as social commerce has rapidly increased since 2017, and previous literature reviews in this area have largely focused on publications up to 2016. Many new phenomena have arisen in the market that has yet to be explored. Below are the lists of inclusion and exclusion criteria for this study.

4.3. Paper assessment

We assessed the 107 identified articles and coded them into categories. After reading the abstract, theories, methodology, data collection, and results of all articles, we identified 56 empirical papers based on the social commerce-related context in the works. We focused on the following three main issues: 1) factors influencing consumer behaviors in the social commerce context, 2) perceptions of organisms or individuals in the social commerce environment, and 3) responses to or results in the area of social commerce. The articles were thus classified according to these three main issues (categories), as shown in Table 3.

5. Findings

We report the results of our analysis focusing on the three main issues, which are the development of social commerce, the framework of social commerce research based on the SOR model, and the consequences of social commerce influences. The investigation for each issue

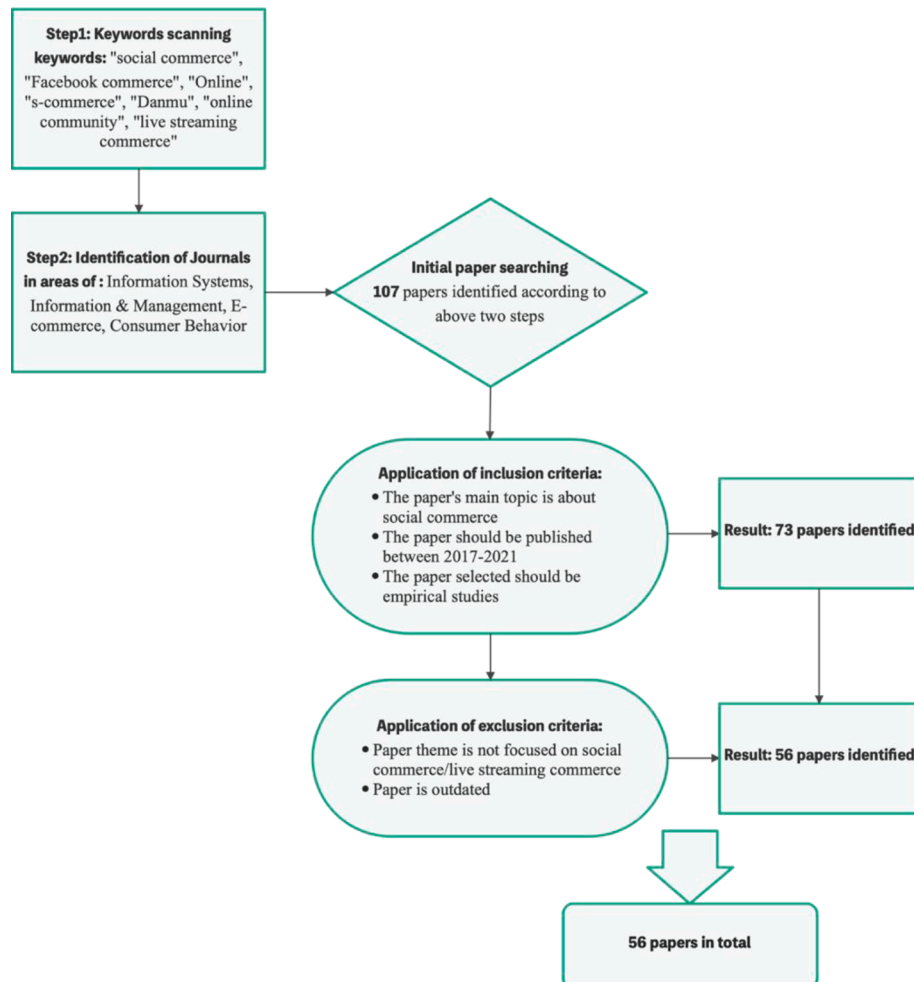


Fig. 1. Literature search strategy.

Table 3

Articles classified within each issue are.

Stimulus	Organism	Response
Moser et al. (2017), Park et al. (2018), Hu et al. (2019); Dong and Wang (2018), Chen and Lin (2018), Yahia et al. (2018), Leeraphong and Sukrat (2018), Ko (2018), Lin et al. (2019), Doha et al. (2019), Cheng et al. (2019), Chen et al. (2020), Friedrich et al. (2019), Xu et al. (2019), Hu et al. (2019), Sun et al. (2019), Cai and Wahn (2019), Zhou (2020), Wang et al. (2019), Wang et al. (2020), Chen et al. (2020), Hu and Chaudhry (2020), Chopdar and Balakrishnan (2020), Leong et al. (2018), Fang and Li (2020), Xu et al. (2020), Wongkitrungrueng and Assarut (2020), Hsu (2020), Molinillo et al. (2020), Sokolova and Kefi (2020), Kang et al. (2021), Ming et al. (2021), Zhao et al. (2021), Singh et al. (2021), Zhang et al. (2021)	Hu et al. (2019), Chung et al. (2017), Aladwani (2018), Fang et al. (2018), Osatuyi and Qin (2018), Setyani et al. (2019), Cheng et al. (2019), Xu et al. (2019), Wang et al. (2019), Sun et al. (2019), Friedrich et al. (2019), Lin et al. (2019), Hu et al. (2019), Xue et al. (2020), Wang et al. (2020), Hou et al. (2020), Chen et al. (2020), Chopdar and Balakrishnan (2020), Wongkitrungrueng and Assarut (2020), Xu et al. (2020), Hsu (2020), Molinillo et al. (2020), Hu and Chaudhry (2020), Hornig and Wu (2020), Zhao et al. (2021), Ma (2021), Singh et al. (2021), Zhang et al. (2021)	Hu et al. (2019), Osatuyi and Qin (2018), Cheng et al. (2019), Xu et al. (2019), Wang et al. (2019), Wang and Herrando (2019), Sun et al. (2019), Friedrich et al. (2019), Xu et al. (2020), Hu and Chaudhry (2020), Chopdar and Balakrishnan (2020), Molinillo et al. (2020), Hsu (2020), Martínez-López et al. (2020), Cheng et al. (2021), Singh et al. (2021), Liao et al. (2021), Attar et al. (2021), Zhang et al. (2021)

is shown in the following figures and tables.

5.1. Development of social commerce

The emerging phenomenon of social commerce has attracted the attention of many researchers in recent years (Fang et al., 2018; Hu et al., 2019; Zafar et al., 2019; Liu et al., 2019; Molinillo et al., 2020). For instance, in earlier studies, researchers often explored user behaviors affected by social commerce on websites (Busalim and Hussin, 2016); however, with the development of Web 2.0 and the popularity of mobile use, firms have conducted strategies to enrich consumers' online shopping experience by providing them with socialized products on social networking sites (Hu et al., 2017). Furthermore, with the rising demand for user interaction and engagement, studies have paid more attention to user characteristics and personalities (Chen and Lin, 2018; Hsu, 2020). In addition, as new phenomena, such as live-streaming commerce, Danmu, and community commerce, become prevalent among online consumers, marketers have found them to be valuable. Therefore, more studies are being carried out focusing on new social commerce phenomena. Fig. 2 shows the key topics and themes that were discussed in papers published from 2017 to 2021. These topics are found in social commerce relevant literature during the past five years. We used the keywords "social commerce" and "s-commerce" to identify

relevant issues in this area. Besides, we also included other traditional social commerce-related terms such as social shopping, c-commerce, social media marketing, etc.

Among a variety of features and phenomena in social commerce, we found live streaming, Danmu, and online community is the three main topics being addressed in social commerce studies (Lin et al., 2017; Chan et al., 2017; Hu et al., 2019; Lam et al., 2019). Thus, we provide a detailed analysis of these three phenomena in the following section.

5.2. Live-Streaming commerce

The prevalence of live-streaming commerce started in 2011 (Xu et al., 2020). Facebook Live, Taobao Live, YouTube Live, and Twitch are the dominant platforms for live-streaming activities. Despite information sharing, chatting, and entertainment behaviors at the earlier stage, users are increasingly more intent to focus on product viewing and shopping through live-streaming platforms (Cai and Wahn, 2019). As a special combination of multiple media forms, live streaming provides a joint platform for broadcasters who uploads real-time video content, as well as an audience who can interact with the broadcaster and other views in the real-time environment (Hou et al., 2020).

According to previous literature, live-streaming commerce is defined as a new subset of social commerce, which has a unique feature in its implementation of social interaction in real-time among consumers and traders (Xu et al., 2020). The academic community has paid growing attention to live streaming, which mainly focuses on exploring antecedents of viewers' social interactions (Hu et al., 2017; Hu and Chaudhry, 2020; Kang et al., 2021). There are two main types of live-streaming commerce. The first is e-commerce platforms with live stream features, such as Taobao Live, which allows consumers to watch videos in real-time with product display on the e-commerce platform; the real-time video can be created either by a brand or a key opinion leader (KOL) hired by a multi-channel network (MCN) company (Cai and Wahn, 2019). Another type of live-streaming commerce was brought about by social media platforms—for example, YouTube Live, Facebook Live, and TikTok—where online celebrities and live streamers can create a real-time environment in which to build interpersonal relationships between themselves and their audiences. This provides a socialized channel for users who may be able to enjoy hedonic shopping benefits and share their shopping experiences on these social media platforms (Wongkitrungrueng and Assarut, 2020). Both types of live-streaming commerce exhibit critical factors for enticing consumers' online shopping behaviors, as consumers are enriched with improved information quality (brand awareness, product display, and user experiences in real-time) and are provided with the opportunity to enhance social interaction.

Overall, live streaming commerce is experiencing rapid development, especially in China. In China, Taobao Live, Tianmao Live and other live streaming platforms have been prevailing during these years, more than 900 billion yuan has been reached as their profit in 2021 (Xu et al., 2021). It is explored that the biggest encouragement of live streaming development is the policies conducted by the Chinese government. For example, the Chinese government has carried out the "2021 Chinese Government Work Report" including live streaming commerce as a national strategy (Singh et al., 2021). On the contrary, it is found that live streaming commerce in other countries is still at its



Fig. 2. Evolution of issues addressed in social commerce studies 2017–2021.

initial stage of development, with broadcasters of low degree of specialization and lack of large-scale professional training (Xu et al., 2020). Given the certain background of live streaming commerce development, current research attention has been paid to the influencing factors including IT-based functions of live streaming commerce, consumer-related factors, broadcaster-related factors, and consumer perceived values. In sum, factors influencing the development of live streaming commerce play an important role in this topic.

5.3. Danmu

Danmu is adopted widely by live streaming platforms or online videos to enhance interactions among viewers (Wang et al., 2019). Danmu is described by several previous studies as an emerging type of user-generated content, which plays an increasing role in affecting behaviors on social commerce platforms (He et al., 2018; Fan et al., 2018; Wang et al., 2019). Danmu has also been found to make possible efficient information exchange among video or live-streaming viewers (Fang et al., 2018). While Danmu is relatively new in the social commerce market, it has already secured an important role among video platforms. For example, in China, Danmu functionality has been adopted by almost all video platforms for users to seek opportunities to exchange comments and information (Fan et al., 2018). As well as reinforcing user engagement, Danmu has another important function on social commerce platforms: enticing consumers' purchase intentions by providing shopping experiences i.e., the function of a product, and encouraging product information sharing among consumers. Compared to traditional online consumer commenting, Danmu can facilitate a more enjoyable experience by simultaneously providing timely information exchange and building an atmosphere of co-experience.

5.4. Online community

Due to the development of the sharing economy recently, consumers are encouraged to shop in groups based on a trust mechanism (Moser et al., 2017). Community e-commerce is defined as social networking forums where users can exchange information, interact, and complete transactions with one another (Molinillo et al., 2020). According to the increasing implementation of Web 2.0 technologies on social commerce activities, consumer engagement and social interaction are becoming more and more critical in enhancing online purchase behaviors. For example, the largest Chinese social networking platform, WeChat, had around 1.15 billion active users on the site each month in 2021 (Ma, 2021), providing a massive opportunity for online consumer-to-consumer (C2C) business through WeChat groups. Users in chat groups can interact, share content, and make purchases among other people with similar interests and preferences, which enhances market efficiency by employing accurate market segmentation.

In summary, recent social commerce research has mainly focused on live streaming, Danmu interaction, and online community commerce. Thus, social commerce appears to be performed in many different forms. Existing research has examined new features and activities that have appeared in social commerce studies, showing the complexity and

internal relationships between social commerce factors and effects. Table 4 shows the new features according to the following three main themes.

5.5. Regions of social commerce research

According to our findings in existing articles, we examine the regions they conduct their research, these papers either collect surveys or do interviews or experiments in different countries, and it is shown that most papers are conducted in Asia. Fig. 3 presents the existing social commerce studies conducted in different regions. We have separated these regions into three areas: Asia, Europe, and North America. We did so because countries from Asia, Europe, and North America were included in the 56 selected articles, and research in these three regions has different features and styles. In Fig. 3, it is clear that Asia had the most social commerce research, with 77 %, while North America had 18 %, and Europe had the least with only 5 %. The results are in accord with the giant market size of e-commerce in Asia, and a more detailed analysis of the research on different regions is presented in the discussion section.

5.6. S—O—R model

5.6.1. Stimulus in social commerce

According to Chan et al. (2017), a stimulus arouses consumers' behaviors. After a deep analysis of the identified studies, we found that social commerce stimulus is presently based on three main areas—environmental cues, marketing stimuli, and consumer characteristics. In earlier studies of social commerce stimuli, website attributes and store attractiveness were largely considered to be the relevant environmental stimuli in the SOR model. However, due to the development of technology, including Web 2.0 and cloud computing, consumers' social interactions and connections are more relevant in terms of stimuli on social commerce platforms. For example, live-streaming commerce provides a social, hedonic, and consumer-centered environment for consumers, where they are informed with high-quality information and provided with an immersive experience when shopping online (Xu et al., 2020). Thus, consumers can share and discuss with other consumers and the product sellers in a more social and interactive environment.

Marketing stimuli and situational cues have also been developed in the new social commerce area. For example, marketers may carry out scarcity strategies to entice consumers' purchase intentions by providing limited-edition products, limited-time purchase windows, or limited supply (Wu et al., 2020). Scarcity cues enact restrictions on a variety of availabilities during the online shopping process, either in terms of time or number of products. Many studies have shown that scarcity promotion strategies cause anxiety or uncertainty when consumers view products online, thus leading to the urge to buy. As well as scarcity cues, product discounts and supply shortages also increase consumers' potential impulse-buying intentions. Moreover, marketers also use the attractiveness of the live-streaming broadcaster to inspire consumers' buying intentions. For example, live-streaming commerce provides face-to-face real-time interaction for sellers and their consumers, with the sellers' attractiveness included in the product function display through the use of the product in real-time, scenario-based promotion strategies, and the broadcasters' personal traits that enrich consumers' shopping experiences and intrigue consumers to luxuriate in the live-streaming environment (Cai and Wohn, 2019; Xu et al., 2020; Kang et al., 2021).

Consumers' characteristics are important in mediating the influence of social commerce in online impulse purchasing. Previous studies have shown that consumers with greater desire or purchase intention are more likely to respond with impulse-buying behavior to relevant stimuli. The role of consumers' characteristics can then be identified as the mediating effect of impulse purchasing (Chan et al., 2017). Consumers' interactions and socialization in social commerce environments have been found to bridge the gap between social commerce and impulse

Table 4

A summary of new features of social commerce.

Live-streaming commerce	Danmu	Online community
<ul style="list-style-type: none"> • Social interactions in real time • Live-streaming product display • Live streamers/celebrities • Enrich information quality 	<ul style="list-style-type: none"> • Enhance interaction among users • An emerging type of user-generated content • Create efficient information exchange 	<ul style="list-style-type: none"> • Shop online in groups • Based on the trust mechanism • C2C in social networking groups

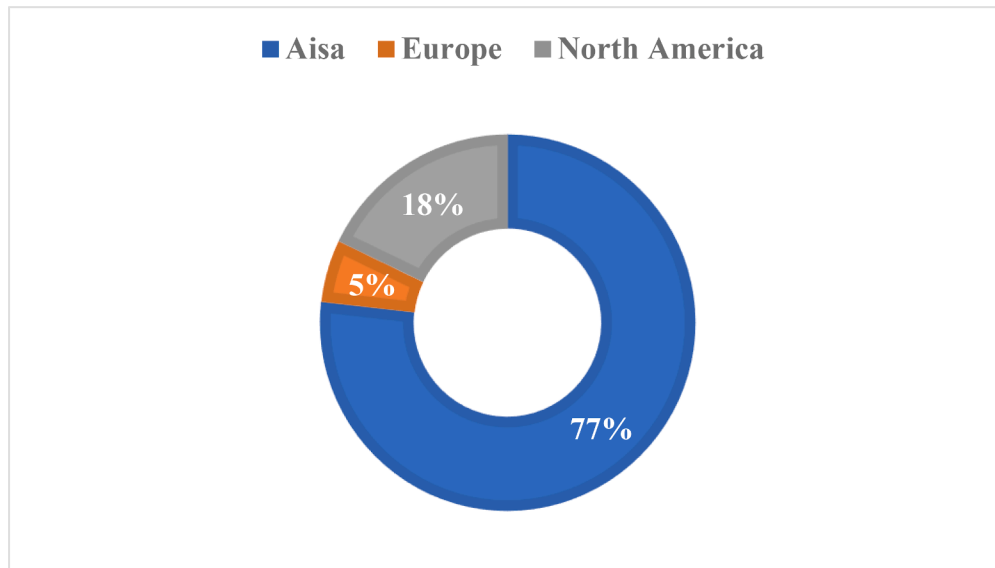


Fig. 3. Regions of social commerce research in recent years.

purchasing. For example, consumers' hedonic needs determine whether enjoyable shopping experiences will trigger consumers' buying intentions (Cai and Wohn, 2019), and consumers' resistance to change will impede the influence of rapidly developing technology in shopping

environments (Xu et al., 2020).

5.6.2. Organism in social commerce

According to Chan et al. (2017), the organism is the perception of

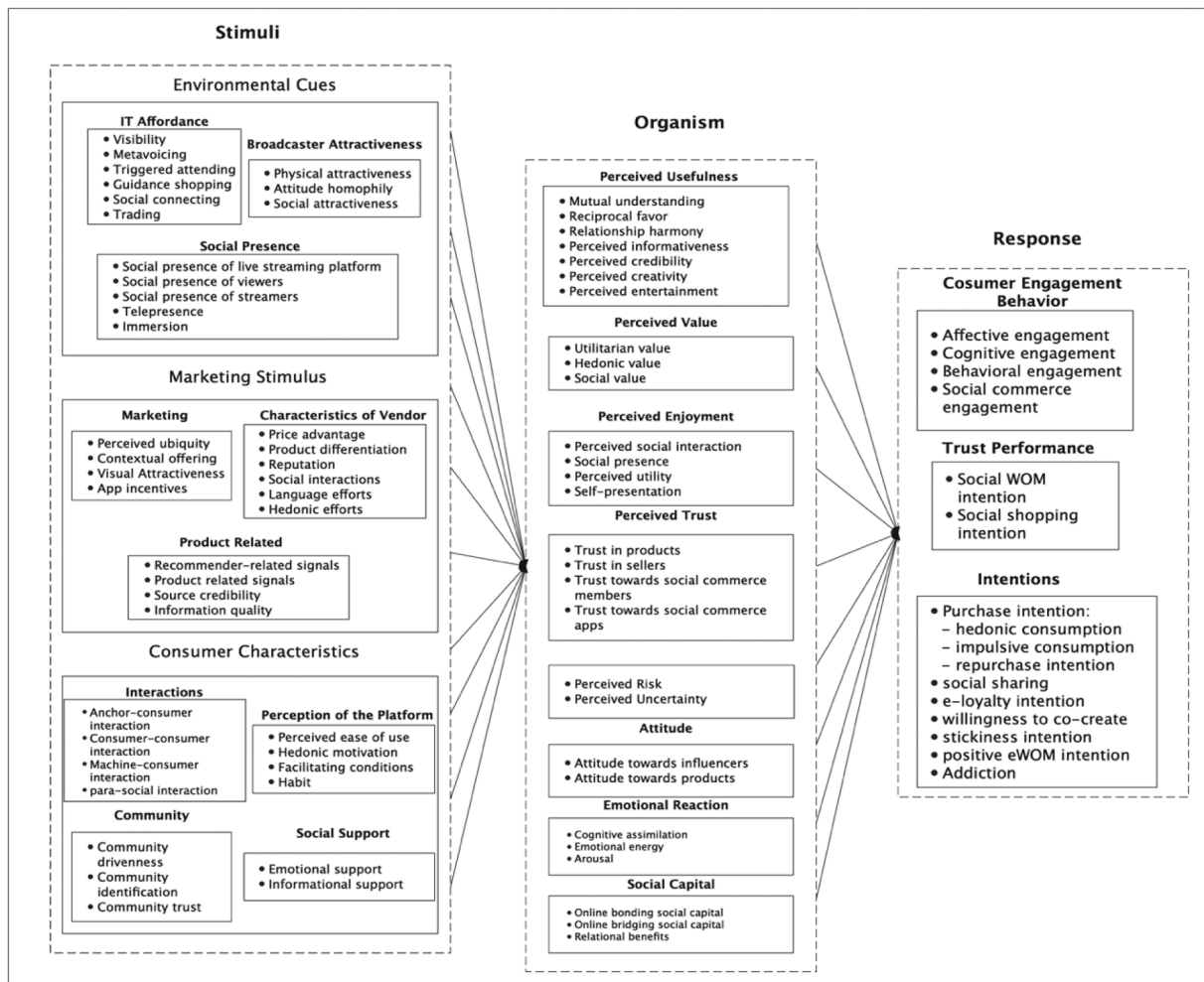


Fig. 4. Relationships investigated in the social commerce context using the SOR model.

consumers. Perceived value, perceived sacrifice, and psychological reaction are the main perception of consumers due to social commerce effects. Many studies have identified two types of organisms of consumer reactions—cognitive and affective (Wu et al., 2020). Consumers' cognitive reactions are based on attitudes, values, and perceptions, while their affective reactions are mainly about pleasure, arousal, and dominance. For example, the value of a product or the trust of a live streamer may influence a consumer's cognitive evaluation, and the impressive performance of sellers in the live-streaming environment may arouse a consumer's shopping intention.

On the other hand, perceived risks and sacrifice also affect consumers' evaluations of products or purchase experiences. For example, product scarcity may cause anxiety or feelings of worry in consumers, and in the live-streaming context, a face-to-face real-time environment may enhance the effects of these sentiments in consumers, thus leading to impulse purchasing (Xu et al., 2020).

After we reviewed the 56 identified papers, we extracted elements relevant to the SOR framework of social commerce and online impulse purchasing. We consolidated the factors of social commerce as a stimulus, exploring consumers' reactions in the social commerce context, including live-streaming commerce and community e-commerce. Finally, we evaluated the outcomes of consumers on their impulse purchase behaviors. Fig. 4 provides a detailed framework of social commerce, reflecting new insights into and influences on consumer behavior.

5.6.3. Response to social commerce

According to our analysis during data extraction, we identified several new activities in the social commerce field, including social activities and commercial activities. In terms of social activities, we found social interaction, online communities, social sharing, live streaming, and user-generated content to be the main activities; in commercial activities, the urge to buy and impulsive buying represented the main activities. The study used the SOR model to explain the internal mechanism of social commerce; thus, the activities were defined as responses, which are introduced below (Fig. 5).

There are two main streams of research in social commerce literature. The first stream focuses on the social behavior of consumers. For instance, Dost et al. (2019) introduced the idea of time pressure as affecting consumers' decision-making processes. Sun et al. (2019) indicated that social sharing is increasingly enabled by technology, and it is necessary to embrace social sharing on online social platforms. Hsu (2020) explored online vloggers, focusing on the *para*-social interactions of their viewers. The second stream of research examined the buying behaviors or buying intentions of consumers in the social commerce context. For instance, Zhang et al. (2018) and Chen et al. (2018)

introduced factors affecting consumers' online impulse-buying behaviors (i.e., website cues, online reviews, atmospheric cues, product presentation, and so on). Some other studies explored consumer perceptions affecting online buying behaviors; for example, Setyani et al. (2019) investigated the psychological mechanisms of consumers' buying behavior; Hollebeek and Macky (2019) discussed consumers' engagement, trust, and values affecting online impulse buying; and Wu et al. (2020) defined consumers' perceived risks, building an expectation–confirmation model in online purchase behaviors. A response is a consumer's reaction to social commerce stimuli and organisms (Cheng et al., 2019). Measuring consumers' buying intentions online has been reported as challenging and sometimes problematic because respondents often behave in a socially desirable manner while being observed during experiments or completing a survey. Therefore, consumers' urges to buy or buying intentions are difficult to discover; nevertheless, they have often been used as estimation tools for actual purchase behaviors in previous studies (Wang and Herrando, 2019; Chou, 2019; Chen et al., 2018). It is explored that consumers in new forms of social commerce such as live streaming are brought with more positive feelings including trust, perceived value, and pleasure, thus consumers are more encouraged to make purchase decisions (Xu et al., 2020). Moreover, compared to websites and traditional e-commerce promotions, live streaming, Danmu, and social community can enhance consumers' perceived transparency, and the more transparency in the shopping environment, the more security is perceived, therefore leading to purchase decision making (Poretski et al., 2020).

Purchase behavior is the behavior of a consumer making a purchase, including planned and impulsive purchases. Previous studies have widely discussed impulsive purchases (Chen and Yao, 2018; Leeraphong and Sukrat, 2018; Chen et al., 2018). For example, Chen et al. (2018) introduced the role of information quality on impulsive buying on Facebook. Wu et al. (2020) defined the determinants of online impulsive buying using flow theory issues. Moreover, Zhao et al. (2021) argued that situational factors such as personal economic well-being, family influence, and availability of time have positive impacts on consumers' impulsive purchase behaviors. According to Zhang et al. (2021), the rapidly increasing implementation of interactive technologies has encouraged relationship building between social commerce and the role of consumers. In other words, social interaction is one of the recent core characteristics of social commerce. Consumers are developing connections with other users and sellers, and these connections on social commerce platforms, such as social media and social networking sites, allow consumers to gain high-quality information on purchase behavior.

Social commerce is built on several types of social media, both commercial and non-commercial, and focuses on social media-supported activities (Hu et al., 2019). According to Li et al. (2021), social

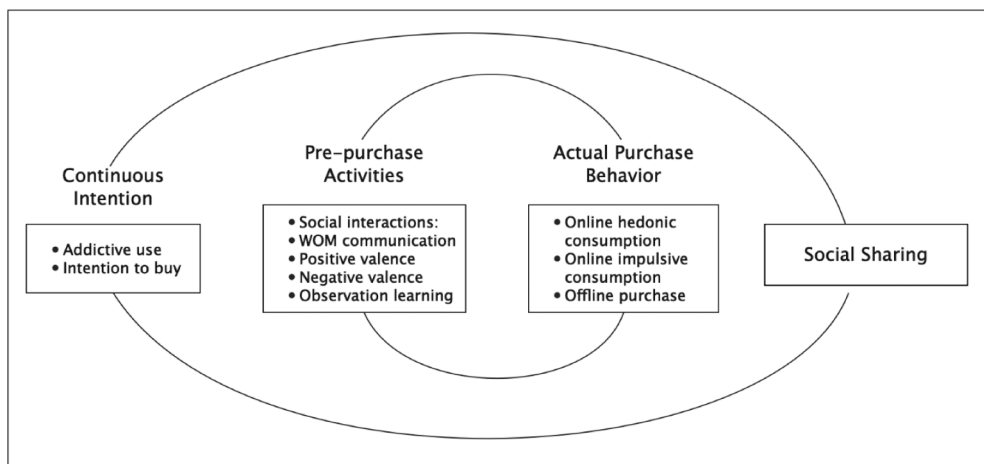


Fig. 5. Response in social commerce.

commerce provides channels for consumers to create interpersonal relationships with each other, such as by participating in communities, sharing shopping experiences, and advising friends by providing them with suitable guidance in purchasing decisions. For example, a live-streaming video viewer may share the broadcaster's video on their page. This behavior may enhance interactivity between online users and modify the role of consumers. When a consumer shares a video or product, they suddenly become the information provider to another user, which may influence others' online purchase decisions (Xu et al., 2020).

6. Discussion

Having described the findings from previous social commerce research, we present our discussion to provide some deeper insights based on our findings. First, we discuss the research region in the social commerce context, arguing that this situation is influenced by some cultural habits. Second, since technological advances have boosted the development of social commerce, there are many new effects to study. Third, we propose several new directions for social commerce development.

7. Research region

Depending on our findings, most of the social commerce research is conducted in Asia, with several 77 %. More specifically, China has most frequently taken part in Asian research on social commerce in areas of live-streaming commerce, Danmu, and community commerce. Notably, the first appearance of Danmu was in Japan, while its prevalence is in China. People avidly communicate via videos, live streaming, and even expressing love using Danmu, and now Danmu has become an important tool in social commerce. In general, more significant consumer engagement occurs during purchasing in Asian countries; Danmu allows individuals to interact with each other, and consumers can be informed by additional pre-purchase experiences. Moreover, live-streaming commerce is more developed in Asia—not only in China, but also in Thailand, South Korea, and Japan (Fang et al., 2018). Compared to a variety of live-streaming commerce platforms, such as Douyin, Tianmao, Taobao, Jingdong, and Pinduoduo, in China, only a few live-streaming commerce platforms have appeared in other countries. In countries such as the United States and Europe, people use Amazon Live and Facebook Live, with some research discussing the live-streaming platform Twitch TV. However, the latter platform is more focused on watching digital game videos rather than shopping online (Hu et al., 2017; Zafar et al., 2019). In addition, live-streaming commerce research in Asia focuses largely on the driving forces of live-streaming commerce, comparing traditional e-commerce with live-streaming commerce, and *para*-social interactions in live-streaming commerce. Research on the US and European countries regarding live-streaming commerce focuses on discussing user behaviors and the phenomenon of live-streaming commerce.

The reason live-streaming commerce is so well developed in Asian countries is probably that they have both a large population and market and incorporating user comment functionality has been adopted early by online platforms to encourage individual communication among consumers in 2006 (Fan et al., 2018). Furthermore, watching live-streaming videos is rapidly becoming a mainstream purchasing activity for mobile users. Many people have fast-paced lives and less time to go to shops, and live-streaming commerce provides an efficient way to shop online with an immersive shopping experience. China even has several shopping festivals during the year, and most are live-streaming shopping events (Xu et al., 2020). For example, during the “June 18” event in 2021, Taobao's live-streaming platform drove sales of about 20 billion yuan while broadcasting live streaming (Ma, 2021). Moreover, it is more convenient to conduct research in Asian countries because the market for social commerce is large enough that it is easier to find people

to participate in surveys or experiments for various social commerce experiences.

7.1. IT affordance

With the development of varieties of computer-mediated communication technologies in the past few years and the advent of Web 2.0, people can engage themselves more in online shopping (Fan et al., 2018). Consumers are provided with a more valuable online shopping experience, which in return brings more consumers. For example, the technical capability allows consumers to post their comments during live streaming and communicate with streamers by Danmu or through shared chat rooms; this enhances real-time communication and contributes to purchase decisions (Sun et al., 2019). Furthermore, IT advances to provide consumers with better visibility for product information online. Especially in live streaming and community commerce, streamers provide consumers with product information regarding how to use a given product and product details (Chen et al., 2020).

Based on the findings and analysis of the literature identified in our present study, existing social commerce research has mainly focused on interpersonal communication in IT affordance. For example, Chen et al. (2020) conducted research on technological attractiveness, especially in the task, social, and physical dimensions. Researchers found that suitable product locations online and valuable product information could extend consumer perceptions and enable user interactions in social commerce contexts. This further facilitates consumers' purchase behaviors. Furthermore, the role of IT in the social-tie building is focused on by many researchers in this context. Online social commerce technology has been developed not only to maintain communication but also to support social commerce users in transaction processing (Dong and Wang, 2018). Most of the results of research papers (e.g., Chen et al., 2020; Dong and Wang, 2018; Sun et al., 2019) indicated that IT affordance could positively encourage consumer communication and interaction, which positively influences consumers' purchasing decisions. However, there are still some difficulties associated with IT affordance research in the social commerce context—for example, researchers need to find or develop theoretical foundations that fit new technologies in this area.

7.2. New directions of social commerce development

This study generated fruitful findings that extend research on social commerce and online consumer behaviors and provides a general overview of social commerce. Due to the development of AI technology and research methods, future research could consider the new trend of social commerce research and discuss how social commerce will be shaped around the world.

In previous social commerce studies, the most-adopted research methods were surveys, questionnaires, and interviews. This is reasonable, as surveys or questionnaires can be used as an indicator of consumers' purchase behaviors and measure consumers' perceptions and other psychological motives (Sun et al., 2019). However, due to the development of AI, there is a trend toward using machine learning methods to analyze consumer behavior and predict consumers' future behavioral patterns in the social commerce context. For example, Park et al. (2018) used a large-scale dataset of an online community to examine the effect of the relationships between social connections and users' purchase behaviors in online communities. Moreover, Mou and Benyoucef (2021) used a *meta*-analysis to investigate successful models in motivating consumer behavior. Meanwhile, the most-adopted method for analyzing large sets of data on social commerce is text mining (Chen et al., 2020). Xu et al. (2020) also suggest this method can be maintained to be the most-used method in similar sorts of analysis. Danmu, live-streaming comments, and online community interactions can be analyzed using data-crawling technology and using sentiment analysis

can indicate whether a user has purchase or sharing intentions. Furthermore, with increased numbers of views, it is easier to use text comments of views and responses of live streamers to replace the data collected by questionnaires and interviews.

Given our analysis, we found that current social commerce studies carried many of the benefits and usefulness of social commerce development. For example, some studies have investigated the implication of live-streaming commerce on marketing (Wongkitrungrueng and Assarut, 2020; Hu and Chaudhry, 2020). Some researchers have carried out analyses of the influences of the continued use of live-streaming services (Singh et al., 2021), and most of the identified studies discuss the driving forces of purchase behaviors in the social commerce context (Ko, 2018; Friedrich et al., 2019; Sun et al., 2019; Fang and Li, 2020). While it is non-negligible that there are risks and the bad side to social commerce. For instance, there is the risk that consumers may buy fake products through live-streaming commerce, and most social commerce, including live streaming, has a very high return rate. It is thus important to conduct governance studies in this area. It is also necessary to build a framework to standardize social commerce policies and procedures and reduce economic risks. Based on an increasing body of social commerce research and the increasing size of the online shopping market, governance studies will be the main trend in future social commerce studies.

As noted earlier, social commerce studies generally use the SOR framework and various behavior theories, such as flow theory, parasocial interaction theory, and so on (Chen et al., 2020; Xu et al., 2020; Chen et al., 2021). These theories provide researchers with the foundation to analyze consumer perceptions and behaviors in social commerce studies. While the future of social commerce studies is changing, some alternative theories are also carried out for suitable analysis. For example, to draw attention to the driving force of social commerce based on big data analysis, theories of social interaction and social contagion are necessary. Furthermore, as technological innovation often hinges on the resistance behavior of both firms and consumers, resistance-related theories will lead the way in this kind of research rather than pure behavioral theories.

8. Conclusion

This study provides an overview of new phenomena in social commerce concepts. A systematic review covering studies published between 2017 and 2021 was addressed; after reviewing several processes, 56 papers were ultimately selected for understanding the framework of social commerce regarding new activities that have emerged in the market. This study provides a clear view of social commerce and consumer behavior by identifying the stimulus, organism, and response of social commerce.

9. Theoretical contribution

This study contributes to prior literature from the following perspectives. First, it advances consumer behavior including both commercial and non-commercial behavior in the social commerce context. As live-streaming commerce, Danmu culture, and community commerce are new phenomena in the market, their impacts on social commerce are striking. Thus, this study provides an overview of these new phenomena by linking them to existing theories in the field of information systems, marketing, and management. Second, this study yields insights into how consumer behavior is influenced by the emergence of social commerce. This study will thus enrich the understanding of determinants of social commerce on online consumer behavior, including social, purchasing, and sharing behaviors. Finally, this study extends the research on social commerce by exploring new features and characteristics in the environment.

10. Practical contribution

Since the development of IT has been revolutionizing how people perform on social commerce platforms, understanding what features of social commerce drive consumers to purchase or how it entices consumers' purchase intentions in social commerce is crucial for the online traders or broadcasters to maintain their competitiveness, which future contributes to the sustainability of the social commerce ecosystem. In addition, it is practical for online traders or broadcasters to improve their visibility and attractiveness by understanding that consumers' highly trustworthy and informative could facilitate their impulsive purchases on social commerce platforms. Moreover, the significant impact of consumers' social influence suggests that marketers should provide more opportunities for consumers to interact with others on social commerce platforms.

CRedit authorship contribution statement

Wenjin Zhao: Conceptualization, Writing – original draft. **Fang Hu:** Methodology, Investigation, Resources. **Jun Wang:** Validation, Software. **Tao Shu:** Writing – review & editing. **Yun Xu:** Visualization, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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