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Understanding the role of technology attractiveness in promoting social commerce engagement: Moderating effect of personal interest

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ABSTRACT

The rapid growth and increasing convergence of social networking and e-commerce open up a new era of social commerce, wherein people are encouraged to engage in various social interactions that are conducive to commercial activities. However, current studies are limited in investigating the concept of social commerce engagement and the processes through which social commerce engagement is established. Drawing upon interpersonal attraction theory and relationship management perspective, this study proposes a research model to address the influences of technology attractiveness, which is composed of task, social, and physical attractiveness, on social commerce involvement and engagement. Considering that social interactions in social commerce community are often stimulated by users' common interests in products and consumption activities, the moderating role of personal interest is further examined by applying personality literature to reveal how technology attractiveness and community involvement take effect in the social commerce context. Empirical results indicate that all the three aspects of technology attractiveness (*i.e.*, task, social, and physical attractiveness) are positively associated with community involvement, which in turn affects social commerce engagement. In particular, involvement fully mediates the impact of physical attractiveness and partially mediates the effects of task and social attractiveness. Personal interest enhances the effect of social attractiveness, whereas it weakens the effect of physical attractiveness on community involvement. Personal interest also strengthens the positive relationship between community involvement and social commerce engagement. Findings emerged from this study will contribute to the current understanding of how social commerce engagement is formed and help practitioners improve community attractiveness and deliver differential attractiveness to users with different levels of personal interest.

1. Introduction

Recent years witnessed a dramatic increase in the use of social media, and people are more inclined to rely on social technology to acquire product/service information [1]. Accompanied by the development of social media, traditional e-commerce gradually shifts to social commerce, which unlocks the power of social media to engage potential customers in different types of commercial activities, such as sharing, disseminating, and utilizing product reviews [2]. In this sense, social commerce represents a great opportunity for various businesses and is expected to continue growing into an 80 billion dollar market worldwide by 2020 [3]. Despite the bright prospect of social commerce, it also faces several challenges. First, customer engagement in social commerce community represents a major competitive advantage for companies to drive business growth and profits. However, current research and practice pay more attention to active participation, such as contributing and commenting [3–5], but consider less about passive participation, which forms engagement together with active participation. Second, it becomes increasingly expensive for practitioners to attract and retain customers because of continued intense competition and customers' low switching cost [6]. In this regard, understanding the approaches to boost social commerce engagement is also a critical issue for both researchers and practitioners.

This study thus presents an attempt to address the challenges outlined above. Because social commerce success highly depends on customer engagement [1,7], it is important and necessary to investigate

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Table 1
Recent studies on social commerce behaviors.

Author (Year)	Theory and Antecedents	Outcomes
Sharma & Crossler [82]	**Fairness in Information Exchange Theory:** Perceived Surveillance; Perceived Linkage; Perceived Relevance. **Perceived Benefit:** Perceived Usefulness; Perceived Enjoyment. **Communication Privacy Management Theory:** Perceived Privacy Risk; Perceived Ownership; and Perceived Apathy.	Intention to Voluntarily Disclose Information
Cheung et al. [50]	**Information Signaling Theory:** Peer Consumer Purchase; Peer Consumer Review. **Dual-Process Theory:** Consumer Expertise; Consumer Engagement.	Customer Purchase Decision
Zhang et al. [7]	**Environmental Stimuli:** Perceived Interactivity; Perceived Personalization; and Perceived Sociability. **Virtual Customer Experiences:** Social Support; Social Presence; and Flow.	Social Commerce Intention
Chen & Shen [3]	**Social Support:** Emotional Support; Informational Support. **Commitment Theory:** Community Commitment. **Trust Transfer Theory:** Trust toward Community, Trust toward Members.	Social Shopping Intention; Social Sharing Intention
Hajli [119]	**Social Commerce Constructs:** Recommendation and Referrals; Ratings and Reviews; Forums and Communities. **Trust Theory:** Trust	Intention to Buy
Kang & Johnson [83]	**Meta-Theoretic Model of Motivation and Personality:** • **Elemental Traits:** Openness to Experience; Arousal Needs; and Material Resource Needs. • **Compound Traits:** Market Mavenism; Social Browsing; and Value Consciousness. • **Situational Traits:** Socializing Gratification, Information-Seeking Gratification; **Moderator:** Tie Strength, Homophily.	Online Social Shopping Intention
Zhang et al. [79]	**Environmental Stimuli:** Perceived Information Fit-to-Task; Perceived Visual Appeal. **Cocreation Experiences:** Customer Learning Value; Social Integrative Value; and Hedonic Value.	Intention of Future Participation
Hu et al. [51]	**Stimuli:** Similarity, Expertise, Benevolence; Support for Recommendations, and Support for Social Interaction. **Organisms:** Perceived Utilitarian Value; Perceived Social Value.	Purchase Intention
Liu et al. [120]	**Social Capital Theory:** • **Structural Capital:** Out-Degrees' Post; In-Degrees' Feedback. • **Cognitive Capital:** Customer Tenure; Customer Expertise. • **Relational Capital:** Reciprocity. **Individual Motivation:** Reputation; Enjoyment of Helping.	Customer Information Sharing Behavior
Xiang et al. [52]	**Environmental Features:** • **Task-Relevant Features**: Information Fit-to-Task. • **Mood-Relevant Features**: Visual Appeal. • **Social-Relevant Features**: Similarity; Expertise; and Likeability. **Organism:** • **Cognitive Reaction:** Perceived Usefulness. • **Affective Reaction:** Perceived Enjoyment. • **Social Reaction:** Parasocial Interaction.	Urge to Buy Impulsively
Zhang & Benyoucef [121]	**Stimulus:** • **Content Characteristics:** Informational Content; Entertaining Content. • **Network Characteristics:** Network Centrality; Tie Strength. • **Interaction Characteristics:** Interactivity; Socializing. • **Other Characteristics:** Product Selection; Website Quality. **Organism:** • **Personal Traits:** Extraversion; Neuroticism. • **Value Perception:** Hedonic Value; Social Value. • **Affections:** Arousal; Brand Love. • **Self-Oriented Perceptions:** Self-Congruence; Self-Construal. • **Social/Relational-Oriented Perceptions:** Normative Influence; Informational Influence. • **Other Factors:** Perceived Privacy Risk; Culture. **Moderators:** Content Type; Culture.	Attention Attraction; Information Seeking; Browsing; Attitude; Purchase Behavior; Information Disclosure; Website Usage; Participation; Information Sharing; and Brand Loyalty
Zhang et al. [122]	**Self-Factor:** Self-Congruence. **Social-Factor:** Social Norms. **Characteristics of Brand Pages:** Information Quality; Interactivity. **Relational Quality:** Trust; Satisfaction; and Commitment.	Brand Loyalty
Akman & Mishra [123]	Perceived Ethics; Perceived Trust; Perceived Enjoyment/Easiness; Perceived Social Pressure; Perceived Satisfaction; and Perceived Awareness.	Intention and Actual Use of Social Commerce
Hajli et al. [124]	**Trust Theory:** Trust. **Social Presence Theory:** Social Presence. **Other Factors:** Social Commerce Information Seeking; Familiarity.	Purchase Intention

(*continued on next page*)

Table 1 (*continued*)

Author (Year)	Theory and Antecedents	Outcomes
Wang & Yu [125]	**WOM Theory:** Positive Valence WOM; Negative Valence WOM; and WOM Content. **Observational Learning Theory:** Observe Consumer Purchase.	Intention to Purchase; Purchase; and Post-Purchase
Farivar et al. [126]	**Trust Transfer Theory:** Trust toward Members; Trust toward Website. **Risk Theory:** Perceived Commerce Risk. **Other Factor:** Usage Habit.	Intention to Purchase

the conceptualization and operationalization of social commerce engagement, as well as the processes through which social commerce engagement is established. Prior studies on customer engagement in online social platforms have provided some general insights into this issue [8–11]. In particular, involvement is widely regarded as a powerful determinant of engagement in various contexts [8,9,12–14]. Community involvement represents a subjective psychological identification process that describes the personal relevance and importance of a relationship with an online community [15,16]. The identification process will facilitate the formation of an ongoing self-categorized relationship with the focal community and further help to explain how to retain customers and promote their engagement in online social activities [16,17]. Following this line of research, and in order to improve the current understating on social commerce engagement, the first research question of this study is to explore how social commerce engagement is defined and operationalized and to what extent community involvement will increase customers' social commerce engagement.

Except for community involvement, website design represents another opportunity to foster social commerce engagement [4,18,19] and is expected to affect social commerce user behavior through relationship building [1]. Drawing upon interpersonal attraction theory, this study introduces a concise and integrated framework to capture design elements in social commerce community and aims to understand how to develop an attractive and vibrant community. Interpersonal attraction theory is a widely used framework to explain why and how a relationship is initiated and developed, wherein attractiveness refers to the extent to which others' attributes and abilities can satisfy one's different needs [20–22]. Some recent studies have demonstrated that attractiveness acts as an important driver of users' attitude and behavior in e-commerce [6,17,23,24] and social media contexts [25]. However, these studies largely focused on limited aspects of attractiveness, but ignored its multidimensional nature, which might result in potential conceptualization problems. For this reason, building on the interpersonal attraction theory [20], this study develops a technology attractiveness framework, including task, social, and physical attractiveness, to explain how social commerce community can be designed to grab attention of customers and promote social commerce community involvement and engagement. In particular, it is also noteworthy that, the three dimensions of technology attractiveness echo the large body of research concerning task-, social-, and physical-related factors in the Information Systems (IS) domain [26–29]. In this regard, drawing upon the technology attractiveness framework to investigate design elements of social commerce community is also consistent with previous IS studies and further offers a new perspective to social commerce research domain. From the discussion above, the second research question of this study is to identify the different aspects of technology attractiveness and evaluate their effects on community involvement and engagement.

A better understanding of the processes through which social commerce engagement is established also needs to consider that different user groups have distinct motivations and website design requirements [4]. Previous studies suggested that a deep understanding of the boundary conditions can enrich our knowledge of the relationships among variables [30,31]. In this regard, the contingency conditions under which both technology attractiveness and community involvement take effect will be further investigated in this study. Considering that social interactions in social commerce community are often stimulated by users' common interests in products and consumption activities, personal interest in social commerce will be employed as the moderating variable. According to the heuristic-systematic model (HSM) [32], people with different personal interests often exhibit distinct information processing styles, and therefore, personal interest is also regarded as one of the most prominent motivational factors that intervene with human decision-making in prior studies [33–36]. With this point of view, this study further considers personal interest as a conditional variable for technology attractiveness and community involvement to take effect. The third research question thus is to answer whether and how the paths from technology attractiveness to community involvement and then social commerce engagement will be moderated by personal interest in social commerce.

The remainder of this study is structured as follows. The next section reviews related work on social commerce, community involvement, interpersonal attraction theory, and personal interest. Section 3 presents the research model and develops the associated hypothesis. Sections 4 and 5 report research design and the results of data analysis, respectively. Section 6 concludes with a discussion of the limitations and implications for both research and practice.

2. Literature review

2.1. Social commerce and social commerce engagement

Social commerce considerably changes the way people think about social media and e-commerce by adding commercial features to social media and building social platforms for e-commerce services [1]. In this sense, social commerce offers an important research opportunity for IS and e-commerce scholars. Table 1 summarizes some recent studies on social commerce behaviors.

In particular, this study tries to explore the concept of social commerce engagement by theorizing social commerce behavior. The concept of engagement has been widely investigated in different fields such as education [37,38], brand marketing [12,39,40], mobile health [41,42], organizational behavior [43,44], and online games [45–47]. Specifically, Mendes de Leon et al. [48] defined social engagement as the extent to which people participate in various types of social activities. Van Doorn et al. [40] defined customer engagement as "customer's behavioral manifestations that have a brand or firm focus, beyond purchase, resulting from motivational drivers" (p. 254). Lehmann et al. [49] indicated that user engagement is associated with users' willingness to invest time, attention, and emotion on a product or service. From the insights obtained from Table 1 and prior studies on user engagement, this study defines social commerce engagement as the behavioral manifestations that represent the level of users' investment, participation, and efforts in social commerce activities. In particular, this study operationalizes social commerce engagement as social interaction activities, including both active participation, such as sharing commercial information, and passive participation, such as reading online reviews. It is also necessary to recognize that purchasing decision is often supposed to be the outcome of social interaction activities [50–52] and thus is not included as a constituent of social commerce

engagement in this study.

2.2. Community involvement

Involvement is defined as one's beliefs or feelings concerning the personal relevance and the importance of an object [53], such as product involvement [54], brand involvement [55], website involvement [56], and community involvement [16]. In particular, involvement describes an internal psychological state and reflects an individual's ongoing concerns toward the importance and relevance of an object. In this regard, community involvement in this study is defined as an individual's beliefs about the personal relevance and importance of a social commerce community.

Previous studies have identified different antecedents of involvement, such as individual factors (*e.g.*, needs, reputation, and skills gaining) and community/website factors (*e.g.*, multimedia vividness, level of active control, and reciprocal communication) [15,56,57]. However, these studies primarily focus on how involvement is generally developed in online community but fail to explain what initially facilitates the formation of the involvement. Considering that community involvement represents a psychological identification process of developing and maintaining a self-defining relationship with the focal community [16], attractiveness may play a fundamental role in explaining how a relationship is initially established and realized [21,22]. In the next section, we will extend interpersonal attraction theory to the IS field and develop an integrated technology attractiveness framework to help address this issue.

Prior studies also demonstrated that involvement is associated with a variety of desirable outcomes such as community participation and brand loyalty [58], knowledge contribution intention and performance [15,59], self-presentation [16], and product purchase intention [56]. In particular, the relationship between involvement and engagement has been well examined in the literature [8,9,12–14]. However, some controversial findings were also reported in previous studies. Although most studies suggested a positive relationship between them, some other scholars [54,60] pointed out that when there is a lack of related product knowledge, involvement may enhance users' risk perception, which is believed to be negatively associated with customer engagement [61]. Motivated by these observations, this study attempts to explore the boundary conditions under which involvement will exert a positive effect on engagement. Considering that people with higher interest tend to be more knowledgeable and skilled [33,62], the moderating effect of personal interest in social commerce thus will be further addressed in this study.

2.3. Interpersonal attraction theory and technology attractiveness framework

The concept of attraction was originally proposed by the interpersonal communication scholars to measure "an individual's tendency or predisposition to evaluate another person or a symbol of that person in a positive (or negative) way" ([63], p.3). On the basis of this definition, attractiveness can be understood as one's initial impression and evaluation to the abilities and physical attributes of other entities [22,64]. Attractiveness was widely used to explain why people initiate, develop, and maintain a communal relationship with other entities, and it can be further employed to predict attitude and behavior of people [20,21]. Generally speaking, attractiveness is derived from the potential benefits. For example, Harris et al. [22] believed that a certain degree of attractiveness is necessary for launching a positive interaction, and suggested that attractiveness results from one's ability to provide economic, social and resource-based benefits [22]. Fang [23] also demonstrated that attractiveness is associated with one's task-related ability and sociability. Elbedweihy et al. [24] further suggested that brand attractiveness is determined by the extent to which the brand satisfies the needs of its customers. The attractiveness of a website also comes from the benefits offered to the website users, such as visual appealing and easy to use website design, interactive and playful usage experience, or perceived relationship rewards [6,17]. Some other studies further suggested that attractiveness plays an important role in IS adoption and usage behavior [25,65–67].

Although most of these studies demonstrated that attractiveness stems from the ability in satisfying one's different kinds of needs in certain aspects, attractiveness was often treated as unidimensional [6,24] or incompletely studied [23] in prior e-commerce research. In this regard, McCroskey et al. [20] suggested that attractiveness should be evaluated from a multidimensional angle, and proposed a three-dimensional interpersonal attraction framework, including task, social, and physical attraction. This framework was extensively investigated in interpersonal relationship and communication research [68–70]. In addition, a large body of research in IS field also suggested that task- and social-related abilities of social commerce community, as well as its appealing visual design, greatly attract users' attention and further facilitate their positive behaviors [26,27]. From this aspect, McCroskey's three-dimensional interpersonal attraction framework can cover different attractiveness dimensions of social commerce community. This actually can be understood as a process of anthropomorphizing social commerce community. Accordingly, to integrate the current studies on the limited and fragmented aspects of website attractiveness and to bring a new theoretical perspective to social commerce research, this study builds on the three-dimensional interpersonal attraction framework and develops a technology attractiveness framework, in which task, social, and physical attractiveness are incorporated.

2.4. Personal interest

Personal interest has been extensively discussed in different fields, including education, communications, politics, economics, marketing, and IS research. Hidi and Harackiewicz [33] conceptualized personal interest as "a relatively stable motivational orientation or personal disposition that develops over time in relation to a particular topic or domain and is associated with increased knowledge, value, and positive feelings" (p.152), and believed that personal interest is self-initiated and self-determined. Prior [71] found that personal political interest is exceptionally stable both in the short and long term and thus can be regarded as a personality trait. In the IS research, personal Internet interest was defined as "a cognitive state or belief related to the self-fulfilling satisfaction derived from performing the activity" ([62], p.67). Li [72] examined personal interest in online communities, and considered it represents a level of enticement and inclination to pay attention to information and activities in the community. In view of the above, this study defines interest in social commerce as a personal disposition that represents one's stable motivational orientation toward social commerce activities.

Personal interest is widely accepted as an internal contingency factor that affects human decision-making [34–36,73]. For example, Hidi and Harackiewicz [33] demonstrated that personal interest could facilitate one's cognitive functioning. Choi and Lee [36] indicated that personal interest in a given topic determines how people select and process related information, and the selective tendency is expected to be noticeable among those who have high interests. Other studies also suggested that personal interest acts as an important moderator when the provision of choice is available [34,74]. In social commerce communities, individuals are faced with abundant information and multiple choices, and as a result, it is unlikely that people with different personal interests behave in a similar way. In this regard, examining the moderating role of personal interest in social commerce context is reasonable and necessary.

3. Research model and hypothesis

The research model, as shown in Fig. 1, proposes a technology

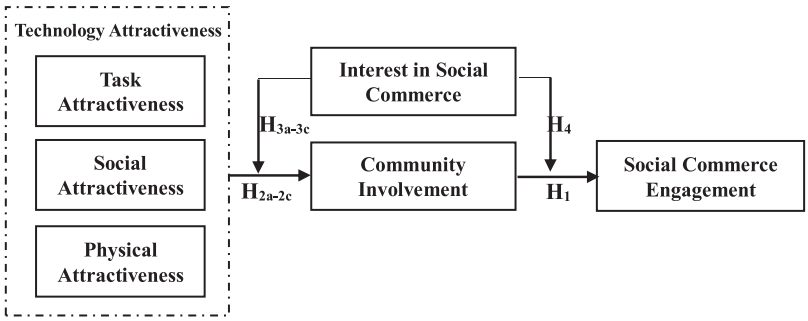


Fig. 1. Research model.

attractiveness framework and investigates the impacts of task, social and physical attractiveness in promoting social commerce engagement *via* community involvement. The moderating effects of personal interest are also addressed in the model. The hypothesized relationships and the corresponding constructs will be discussed in the following sections.

3.1. Community involvement and social commerce engagement

As discussed above, community involvement refers to users' perceived relevance and importance of an online community, and it describes the identification process of being part of a group [16]. In particular, involvement is believed to play a key role in the context of online community. For example, Shang et al. [58] claimed that involvement acts as a fundamental factor to motivate participation in community activities. Xu et al. [15] suggested that individuals with high involvement tend to believe that participation in a community is important and personally relevant and thus exhibit better performance in the community. Kim et al. [16] also demonstrated that with the increase of community involvement, users perceive a higher relevance of the community, thus resulting in a greater desire for online self-presentation.

As a subjective psychological state, involvement is different from engagement, which is conceptualized in this study as a behavioral manifestation that involves participation in social commerce activities [15,55]. In fact, there is a consensus that involvement acts as a crucial driver leading to engagement in various contexts in prior studies [8,9,12–14]. With insights obtained from these prior studies, we predict that community users, who feel involved in a social commerce community, will be more likely to psychologically identify themselves with and attach great importance to participation in the community. Users with a higher involvement will devote more time, energy, and effort in participating in social commercial activities because these activities are regarded as personally relevant. In this regard, we hypothesize that

H1. Community involvement is positively associated with social commerce engagement.

3.2. Technology attractiveness and community involvement

Previous studies suggest that attraction of an online community can result from its ability to deliver multiple benefits to the users [6,17,23]. These benefits include support for users to complete certain tasks and interact with other users [3,5,75–78] or providing users with aesthetically pleasing visual design [26,27,79]. There is a large scope of research in the IS field considering the system functional and interface design for attracting and maintaining the attention of users. However, the existing studies are somewhat fragmented, and there is a lack of integrated theoretical lens to capture the multiple dimensions of technology attraction. In this regard, this study employs the concept of interpersonal attraction, which incorporates three distinct dimensions of attractiveness and was originally conceptualized as a source of influence in communicative interaction [20]. Interpersonal attraction can be adapted for explaining technology attractiveness in this study because social commerce community provides a communication-supportive and highly interactive environment for the users, which is similar to that in interpersonal communication context. Following the basic principles of interpersonal attraction theory, technology attractiveness includes three different dimensions, *i.e.*, task, social, and physical attractiveness in the current study. This section further discusses the roles of task, social, and physical attractiveness in promoting user involvement in social commerce community.

Task attractiveness refers to the attraction rooted in the ability of a community to provide valuable and accurate information for users to complete social commerce tasks [20]. Generally speaking, a community having higher ability to provide valuable, flexible, and consistent information is more likely to satisfy its users' personalized information needs [1,15,56,80]. In this regard, if users are attracted to a community for its ability to consistently offer valuable and accurate information, they will feel that the community is personally relevant and attach great importance to the community, *i.e.*, becoming more involved with the community.

Social attractiveness refers to the attraction rooted in the ability of a community to effectively support social interactions among community users [20]. Social commerce community largely relies on meaningful social interaction to achieve its value [1]. In particular, social interactions can assist people to construe their online social identity and foster closer ties and friendship [3,79,81]. A community with higher social attractiveness demonstrates a greater ability to facilitate social interactions among community users and further to satisfy users' social needs for belongingness and attachment [7,82,83]. Therefore, we predict that social attractiveness positively influences users' perception toward the importance and relevance of the social commerce community.

Except for task and social attractiveness, community users will also likely be attracted by the social commerce website because of the appealing design, that is, physical attractiveness [20]. Physical attractiveness refers to the extent to which a website is well displayed in terms of aesthetic design [26,79]. Visual and aesthetic design is the first and immediate impression the social commerce community makes on its users and can influence user experience during the entire social interaction process [79,84]. In this regard, a community with higher physical attractiveness will attract more attention from the potential users, and their social interaction in the community will also become more pleasurable. As such, physical attractiveness is likely to facilitate users' positive affect toward the social commerce community and further lead to their identification and involvement with the community [1,79]. The above argument is also consistent with interpersonal communication research, which indicates that people with an attractive appearance can easily win others' favors, that is, people are willing to associate themselves with the good-looking people [85,86]. Therefore, if users perceive physical attractiveness of a social commerce community, they tend to form a sense of involvement with the community. Taken together, we propose the following:

H2a. Task attractiveness is positively associated with community involvement of users.

H2b. Social attractiveness is positively associated with community involvement of users.

H2c. Physical attractiveness is positively associated with community involvement of users.

3.3. Moderating role of personal interest in social commerce

Prior studies have shown that people with higher interest tend to be more knowledgeable, enthusiastic, and focused and often more motivated than those with lower personal interest [33,62,72]. In this regard, the HSM can provide a useful theoretical lens for explaining the underlying reasons. The HSM proposes that people with high motivation and great interest will perform systematic information processing, indicating that they will carefully consider all relevant pieces of information and intentionally evaluate the complex aspects of a subject [32]. On the contrary, people with low motivation and little interest tend to perform heuristic information processing, indicating that they have weak incentives to engage in active thinking, and they will mainly rely on superficial information and simple cues that are easy to acquire and process to form their judgments [32]. Prior studies also confirmed the aforementioned theoretical claims and demonstrated that high interested people will focus more on deep information processing activities, whereas low interested people prefer shallow information processing activities [87–89]. Therefore, the moderating effect of personal interest will be discussed on the basis of the two types of information processing.

In the context of social commerce, task attractiveness is derived from community's ability to provide valuable information to complete commerce-related tasks, and social attractiveness is rooted in community's ability to efficiently facilitate social interactions among community users. In this sense, both task and social attractiveness can be understood as usefulness perceptions, *i.e.*, functional and social usefulness, of a social commerce community. Notably, the evaluation of usefulness requires high cognitive efforts and corresponds to systematic and central route of information processing [81,90]. In this regard, individuals with higher personal interest in social commerce are more likely to carry out systematical information processing as argued above [87,88]. As a result, the effects of task and social attractiveness will be stronger for users with higher level of interest. By contrast, physical attractiveness refers to visual appearance and physical design of a social commerce community, and it represents the simple cues that can be easily perceived without the demands of high cognitive efforts, corresponding to heuristic and peripheral routes of information processing [32]. Therefore, physical attractiveness will be more likely to exert a stronger effect on community involvement for users with lower level of interest in social commerce. From the discussion above, we have the following hypotheses:

H3a. The effect of task attractiveness on community involvement is stronger for users with higher level of interest in social commerce.

H3b. The effect of social attractiveness on community involvement is stronger for users with higher level of interest in social commerce.

H3c. The effect of physical attractiveness on community involvement is stronger for users with lower level of interest in social commerce.

Previous studies also demonstrated that people with higher interest in particular activities would be more concerned with these activities and enjoy their involvement more than those with lower interest [33,87]. In this regard, feelings-as-information theory [91] further posits that users who feel a community as personally relevant and important often require additional knowledge and cognitive resources for exerting their community behaviors. This is because personal relevance and importance are believed as the central cues of persuasion, manifesting deep information processing activities [92–96]. Accordingly, community users with higher interest in social commerce will be more likely to perform systematic information processing and further strengthen the effect of community involvement. Prior studies in marketing have also found strong support for the interaction effect of interest and involvement on customer behavior, demonstrating that customers with both high shopping interest and high store involvement tend to spend more time on shopping than other types of customers [97]. Motivated by the aforementioned, this study further predicts that community involvement tends to be a stronger determinant of social commerce engagement for users with higher personal interest in social commerce. Therefore, we propose that

H4. The effect of community involvement on social commerce engagement is stronger for users with higher level of interest in social commerce.

4. Research methodology

4.1. Research setting

In this study, we choose the Douban community, which is one of the most well-known social commerce communities in Mainland China, for data collection. Launched on March 2005, Douban had 150 million registered users at the end of 2016, with 300 million monthly active users. The Douban community is built on the shared interests and social connections among users and allows its users to create their own homepages to facilitate social commerce activities. There are many interest groups in Douban, and users frequently participate in community activities by sharing ratings and comments on purchased products and seeking for advice from online peers. Douban is distinct from other transaction-oriented websites, such as Amazon and Taobao, and it acts as a platform for enabling people to participate in discovering, sharing, and purchasing products. In particular, the Douban community has three main product categories: book, film, and music. In this study, Douban Book is chosen for data collection because it is the earliest and largest book reviews platform in Mainland China and has a significant impact on Chinese book market. It was reported that Douban Book generated over 200 million Yuan revenue every year for book market [3], and this fact further confirms its huge potential in promoting social commerce. The target samples of this study are people who have experience in using Douban Book for social commerce activities, such as writing and reading book reviews or participating in commerce-oriented online social activities that are regularly organized or sponsored by the community.

4.2. Measurement

Measures of all constructs in this study were adapted from prior studies and were slightly modified to fit the current research context. Specifically, task and physical attractiveness were measured with four items adapted from Cyr et al. [26] and Loiacono et al. [27]. Social attractiveness was measured using four items adapted from Lin [98] and Loiacono et al. [27]. Community involvement was measured using four items adapted from Kim et al. [16], and social commerce engagement was measured with three items adapted from Mendes de Leon et al. [48]. Interest in social commerce was measured using a single item "*I am very interested in participating in various activities in Douban Book*" [72]. Single-item measure is often used when a construct is simple and clear to the respondents [99]. Prior meta-analysis studies have found that a single-item measure is more robust than multi-item measures [100], which are more suitable for measuring complex constructs [101]. In this study, personal interest in social commerce is straightforward and easy to understand, and a single-item measure of personal interest also has been frequently used and validated with satisfactory

reliability and low measurement error in prior studies [34,36,71,88]. Therefore, a single-item measure of personal interest is adequate and appropriate. Appendix A lists all measurement items of the constructs. In particular, social commerce engagement is conceptualized as a formative construct, and other constructs are conceptualized as reflective constructs, because the three items of social commerce engagement are not interchangeable. All measures were phrased on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

4.3. Data collection and sample characteristics

Because an online survey was conducted in Mainland China, the questionnaire was first translated into Chinese, and then a backward translation method was employed to ensure the equivalence. Before starting data collection, we conducted a pilot test to ensure that the questionnaire is clear, understandable, and easy to follow. Owing to the nonavailability of official emailing list of all registered users in Douban Book, an invitation message with a URL was randomly sent to people who have a homepage on the social commerce community and are concerned with (*e.g.*, reading, have read, or planning to read) the books on Douban. In addition, to improve sample representativeness, the invitation message was also posted on popular "interest groups" in the book community, and as a result, users who volunteered to participate in online activities but have not left any activity traces were also invited. An introduction to Douban Book, as well as a definition of social commerce, was presented to the potential respondents at the beginning of the questionnaire. This survey was introduced as an opinion survey, which is commonly used to help the respondents better understand the target objects, *i.e.*, social commerce-related activities in Douban Book for this study. The respondents were required to recall their recent social commerce experience on Douban Book and then asked to complete the survey based on their actual experience in Douban Book. Finally, a total of 376 valid responses were obtained, and Table 2 presents the demographic characteristics of the respondents.

Table 2
Demographic statistics (N = 376).

Characteristics	Frequency	Percentage
Gender		
Male	178	47.34
Female	198	52.66
Age		
≤25	227	60.37
26–30	82	21.81
> 30	67	17.82
Education		
≤Junior College	39	10.37
Undergraduate	232	61.70
≥Postgraduate	105	27.93
Usage Experience with Douban		
≤12 Months	71	18.88
1–2 Years	97	25.80
3–4 Years	96	25.53
> 4 Years	112	29.79
In the past 3 months, how many reviews have you read from Douban Book?		
≤10	90	23.94
11–15	84	22.34
16–30	99	26.33
> 30	103	27.39
In the past 3 months, how many reviews have you posted on Douban Book?		
≤1	171	45.48
2–3	118	31.38
4–5	38	10.11
≥6	49	13.03

4.4. Common method bias

The potential common method bias should be checked and discussed because a self-report survey method was used to validate the proposed model. In this study, we utilized two widely employed approaches to test the common method bias. First, we performed Harman's single-factor test [102], and the results indicated that no single component accounts for most of the variance. Second, we followed the procedure proposed by Liang et al. [103] and developed a common method factor, which was reflectively measured using all indicators of constructs in the model. The results suggested that the average substantively explained variance of the indicators is 0.802, and the average method-based variance is 0.005. Therefore, the ratio of substantive variance to method variance is 160:1, and most method factor loadings are not significant. It thus can be concluded that the common method bias is not a serious concern in this study.

5. Data analysis and results

We employed structural equation modeling (SEM) technique to validate the research model and used partial least squares (PLS) approach for data analysis in particular. Compared with the covariance-based SEM, PLS is relatively robust in data analysis and more suitable for testing models with formative constructs [104], which is the case in this study. Following the two-step data analytical procedures [104], the measurement model was first examined to ensure the reliability and validity of the measures, and the structural model was then tested to estimate the hypothesized relationships.

5.1. Measurement model

Reliability and validity of the reflective constructs were evaluated by testing their internal reliability, convergent validity, and discriminant validity. We calculated the values of composite reliability (CR), average variance extracted (AVE), Cronbach's α (CA), and item loadings to assess the internal reliability and convergent validity. As shown in Tables 3 and 4, all indicators are above the threshold value of 0.7 for CR, CA, and item loadings, and above 0.5 for AVE, thus demonstrating that all reflective constructs exhibit good reliability and convergent validity [105]. Discriminant validity can be assessed in two ways: (1) checking whether a given construct's square root of AVE is greater than its correlation with other constructs and (2) checking whether measurement items load highly on their intended construct and not highly on other constructs [105]. As shown in Tables 3 and 4, all reflective constructs exhibit sufficient discriminant validity.

For the formative construct, we followed the procedure proposed by Petter et al. [106] to evaluate the reliability and validity of social commerce engagement. As shown in Table 5, although the weight of the first item of social commerce engagement is nonsignificant, the loading is above 0.7 and statistically significant. Furthermore, the variance inflation factor (VIF) values for the three items of social commerce engagement are 1.673, 1.788, and 1.295, respectively, and below the suggested criteria threshold of 10 and the more stringent threshold of 3 [107]. Therefore, the three items should be retained for further analysis [108]. We further calculated the VIF values to assess the potential multicollinearity problem among major constructs. Results indicate that the VIF values for task attractiveness, social attractiveness, physical attractiveness, community involvement, and social commerce engagement are 1.642, 2.366, 1.482, 2.223, and 1.692, respectively, thus demonstrating that multicollinearity is not an issue in this study.

5.2. Structural model

As illustrated in Fig. 2, the model explains 32.8% and 53.6% of the variance in social commerce engagement and community involvement, respectively. Community involvement has a positive effect on social

Table 3
Construct reliability and validity.

	Mean	*S.D*	CR	CA	AVE	TA	SA	PA	CI	SCE
TA	4.584	1.231	0.919	0.882	0.739	**0.860**				
SA	4.705	1.318	0.954	0.935	0.839	0.495	**0.916**			
PA	4.686	1.347	0.955	0.938	0.843	0.515	0.434	**0.918**		
CI	4.547	1.457	0.963	0.949	0.867	0.457	0.714	0.442	**0.931**	
SCE	4.387	1.317	–	–	–	0.483	0.582	0.393	0.557	–

Note: S.D = standard deviation; CR = composite reliability; CA = Cronbach's α; AVE = average variance extracted; TA = task attractiveness; SA = social attractiveness; PA = physical attractiveness; CI = community involvement; SCE = social commerce engagement. The bold numbers in the diagonal row are square roots of the AVE.

Table 4
Cross-loadings.

	TA	SA	PA	CI
TA1	**0.804**	0.367	0.402	0.368
TA2	**0.878**	0.421	0.448	0.408
TA3	**0.897**	0.428	0.465	0.369
TA4	**0.856**	0.480	0.453	0.420
SA1	0.469	**0.942**	0.410	0.690
SA2	0.430	**0.950**	0.405	0.671
SA3	0.449	**0.935**	0.374	0.674
SA4	0.474	**0.833**	0.405	0.573
PA1	0.437	0.369	**0.918**	0.364
PA2	0.492	0.429	**0.930**	0.440
PA3	0.444	0.412	**0.933**	0.401
PA4	0.511	0.377	**0.890**	0.411
CI1	0.419	0.681	0.398	**0.911**
CI2	0.419	0.649	0.395	**0.950**
CI3	0.426	0.645	0.419	**0.925**
CI4	0.437	0.681	0.434	**0.937**

Note: TA = task attractiveness; SA = social attractiveness; PA = physical attractiveness; CI = community involvement. The bold numbers in the diagonal row are item loadings on their own construct.

Table 5
Reliability and validity of formative construct.

	Items	Weights	T-values	Loadings	T-values	VIF-values
Social commerce engagement (SCE)	SCE1	0.040	0.393	0.790	27.891	1.673
	SCE2	0.612	5.894	0.867	51.381	1.788
	SCE3	0.530	6.083	0.776	28.745	1.295

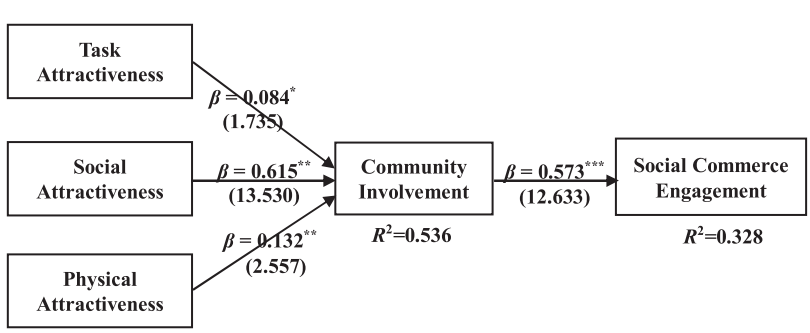
commerce engagement, with a path coefficient at 0.573 (t = 12.633), and $\mathbf{H_1}$ is supported. The three dimensions of technology attractiveness, *i.e.*, task, social, and physical attractiveness, all exert positive effects on community involvement, with path coefficients at 0.084 (t = 1.735), 0.615 (t = 13.530), and 0.132 (t = 2.557), respectively. Therefore, $\mathbf{H_{2a}}$, $\mathbf{H_{2b}}$, and $\mathbf{H_{2c}}$ are supported.

This study further employed between-group analysis method to examine the moderating effect of personal interest in social commerce. Between-group analysis captures the differences among the subgroups at different levels of the moderator and helps obtain a complete picture of the moderating effects [109,110]. In particular, between-group analysis is recommended for moderating test when the categorical moderator is a contextual or dispositional variable [111,112] and when the equal variances cannot be reasonably assumed. Because between-group analysis does not depend on whether or not the assumption of equal variances is satisfied, parameter estimates and statistical inferences will not be affected by such assumption [113]. Between-group analysis is also a commonly used method for estimating the moderating effects in the IS literature [88,90,109,114,115]. Accordingly, we first assessed the research model separately with two subgroups of higher and lower interest in social commerce and then compared the path coefficients across the two subgroups. The significance levels of difference in path coefficients were calculated using the procedure described by Keil et al. [116]. The results in Table 6 indicate that path coefficients between task attractiveness and community involvement are nonsignificant for both groups, indicating no difference between users with higher or lower interest in social commerce in terms of the effect of task attractiveness. Thus, $\mathbf{H_{3a}}$ is not supported. Social attractiveness exerts a stronger effect on community involvement for users with higher interest, whereas physical attractiveness has a greater impact on community involvement for users with lower interest, indicating that $\mathbf{H_{3b}}$ and $\mathbf{H_{3c}}$ are supported. The results also demonstrate that the effect of community involvement on social commerce engagement is stronger for users with higher interest in social commerce, thus supporting $\mathbf{H_4}$.

Furthermore, this study followed the steps proposed by Zhao et al. [117] and Preacher and Hayes [118] to examine the mediating effects of community involvement. As shown in Table 7, community involvement partially mediates the effects of task and social attractiveness, whereas it fully mediates the effect of physical attractiveness on social commerce engagement.

6. Discussion and conclusion

This study presents an initial attempt to investigate the role of technology attractiveness in promoting social commerce engagement



Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The t values are shown in parentheses.

Fig. 2. Data analysis results.

Table 6
Results of moderating effect.

	Full Sample (N = 376)		Higher Interest (N = 183)		Lower Interest (N = 193)		Difference (Higher *vs.* Lower)
	R^2	β	R^2	β	R^2	β	
CI → SCE	0.328	0.573***	0.289	0.538***	0.151	0.388***	t = 22.308
TA → CI	0.536	0.084*	0.580	0.085 N.S.	0.366	0.065 N.S.	–
SA → CI		0.615***		0.687***		0.497***	t = 28.748
PA → CI		0.132**		0.098 N.S.		0.138*	t=-5.428

Note: *p < 0.1, **p < 0.05, ***p < 0.01, N.S. = not significant. TA = task attractiveness, SA = social attractiveness, PA = physical attractiveness, CI = community involvement, SCE = social commerce engagement.

Table 7
Results of mediating effect.

Paths	Indirect Effect			Direct Effect			Results
	Size	LLCI	ULCI	Size	LLCI	ULCI	
TA → CI → SCE	0.020	0.002	0.051	0.204	0.115	0.292	Partial
SA → CI → SCE	0.134	0.056	0.214	0.301	0.203	0.399	Partial
PA → CI → SCE	0.028	0.009	0.060	0.054	0.257	−0.024	Full

Note: Level of confidence = 90%. LLCI/ULCI = lower/upper limit of confidence interval. TA = task attractiveness, SA = social attractiveness, PA = physical attractiveness, CI = community involvement, SCE = social commerce engagement.

through community involvement. The findings demonstrate that community involvement explains 32.8% of the variance in social commerce engagement, thus confirming the crucial role of involvement in facilitating engagement. This finding is also consistent with prior conceptual frameworks proposed by marketing and IS scholars [8,12]. The results also indicate that all the three subdimensions of technology attractiveness significantly affect community involvement and together explain 53.6% of the variance in community involvement, thus demonstrating the importance of attractiveness in building user involvement with a social commerce community.

In addition, community involvement also partially mediates the effects of task and social attractiveness and fully mediates the impact of physical attractiveness on social commerce engagement. These findings provide additional insights into the causal mechanisms through which technology attractiveness factors influence social commerce engagement. Except for the mediating routes, the associations are also moderated by personal interest in social commerce. In particular, the effect of social attractiveness on community involvement and the effect of involvement on social commerce engagement are stronger for users with higher interest in social commerce, whereas the effect of physical attractiveness on community involvement is greater for users with lower interest. However, personal interest in social commerce fails to moderate the relationship between task attractiveness and community involvement, which is nonsignificant for both interest groups. Even in the full model, task attractiveness exerts an impact on community involvement at only 0.1 level of significance. It thus can be inferred that task attractiveness does not play a vital role in social commerce. This may be caused by the primary difference between traditional e-commerce (*e.g.*, Amazon) and social commerce platforms (*e.g.*, Facebook commerce). Traditional e-commerce is task-oriented with the goal of carrying out more efficient and effective transactions, whereas social commerce is inherently social-oriented by gathering people with shared interests, backgrounds, and hobbies. In this regard, commerce-related tasks are not the dominant causes for people to use the social commerce community. Instead, such tasks are the results of informal and socio-emotional communication among people within the community.

6.1. Implications for research

The theoretical contributions of this study can be understood in the following three aspects. First, this study targets a fundamental problem in social commerce, that is, how to encourage customer participation in social commerce communities. With insights obtained from literature on customer engagement, we conceptualize and measure social commerce engagement from a social interaction perspective and empirically examine the role of community involvement in facilitating social commerce engagement. The results show that one-third of the total variance in social commerce engagement has been explained by a single factor. In this regard, this study addresses the major concern in social commerce and captures key point to solve the problem of engagement. This study also enhances current understanding on this emerging phenomenon and highlights the role of community involvement in social commerce.

Second, this study proposes a new perspective to understand how to design an effective social commerce community and how users' relationship with a social commerce community is initially established. Built on the concept of attractiveness in interpersonal communication field, a technology attractiveness framework is developed with three subdimensions, *i.e.*, task, social, and physical attractiveness. In this regard, this study underscores the multi-dimensional nature of attractiveness and identifies the root cause of social commerce attraction. In addition, the three subdimensions of technology attractiveness cover widely investigated task-, social-, and physical-related factors in the social commerce context and thus can integrate well with current IS research. The technology attractiveness framework also explains more than half of the variance in community involvement, thus demonstrating its remarkable explanatory power. Thus, we believe that technology attractiveness framework provides a unified and broadly applicable perspective, which can guide future research.

Third, this study also contributes to the academic literature by shedding new light into the moderating effect of personal interest in social commerce. Personal interest is addressed in this study because social commerce community is generally organized around shared interests and values of its users and thus represents an interest-oriented nature that gathers like-minded people interacting about specific topics of interest. More importantly, a deep understanding of the boundary conditions will reveal how the established relationships take effect in the social commerce context. The results demonstrate some interesting insights into the double-sided effect of personal interest and thus provide a reference point for future research.

6.2. Implications for practice

This study also provides some useful and actionable guidance to social commerce practitioners. First, social commerce engagement is significantly predicted by community involvement, and therefore, building a community with satisfactory user involvement and high personal relevance is especially important for the success of social commerce. There are several ways for managers to integrate new features to achieve personal relevance of a social commerce community. For example, an intelligent recommendation system based on collaborative filtering and demographics will help to deliver specific and personalized products/reviews to the targeted users. The development of subcommunities, which can be constructed on different topics of interest or geographical locations, will also improve users' community involvement.

In addition, this study also highlights the importance of technology attractiveness in facilitating social commerce community involvement and engagement. Specifically, three types of technology attractiveness addressed different ways that practitioners could apply to attract the potential users. Task attractiveness can play an influential role only when social commerce community makes online shopping more effective and time-saving. It is thus necessary for the practitioners to provide

tailored solutions to satisfy users' specific information needs. For example, one-click buying process integrating user-generated reviews and product rating scores will more likely lead to the actual purchase. Social attractiveness is worthy of note for the practitioners as well. Actually, we believe that this is at the heart of social commerce attractiveness, and the results also demonstrated that social attractiveness has the largest impact on users' community involvement. Actionable suggestions include regularly organizing both online and offline activities to create a supportive environment for peer interaction, or providing varied opportunities, such as pop-up messages and push notification, for community users to recommend their comments and ratings to other users. Physical attractiveness will help to grab users' attention at the first glance. In this regard, practitioners should pay careful consideration to website design and aesthetic appeal. Design methods such as A/B test will enable practitioners to determine which pages are well designed and visually engaging.

The third implication for the practitioners lies in the fact that personal interest in social commerce will help the practitioners target specific customer segments. Personal interest has been proven to be an important moderating variable in the research model, and therefore, practitioners should employ different strategies to reach community members who have different levels of interest. In particular, for users with high interest in social commerce, practitioners should provide them with more chances to better communicate and interact with each other, based on their interaction history and interest records. However, for users with low interest in social commerce or those who visit the community for the first time, practitioners should consciously demonstrate design aesthetics and visual appearances of the community.

6.3. Limitations and future research

Although this study has several theoretical and practical merits, its limitations should be acknowledged before generalizing the findings. First, this study was conducted in Mainland China, and the data were collected from an interest-oriented social commerce website. In this regard, the generalization of the findings to other countries and other types of social commerce community (*e.g.*, buying-oriented social commerce) should be made with caution. We also recommend future research to further address the possible cultural differences in enhancing social commerce engagement and examine the effect of technology attractiveness in other types of social commerce. Second, this model explains 53.6% and 32.8% of the variance in community involvement and social commerce engagement, respectively, indicating that the proposed research model has a strong theoretical explanatory power. However, to keep the model simple and controllable, some other important variables, such as perceived value and relationship quality, have not been included in the model. Future research can extend this line of research by assessing the alternative pathways through which technology attractiveness promotes social commerce engagement. Third, this study draws on interpersonal attraction theory to address the multidimensional nature of technology attractiveness in social commerce community. To be consistent with and relevant to prior IS studies, technology attractiveness is measured by integrating task-, social-, and physical-related factors in the IS field. Although the technology attractiveness framework explains a large portion of the variance, future research should realize the potential limitations in the measurement and could further develop social commerce-specific items based on the framework proposed in this study.

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Appendix A. Constructs and items

Task Attractiveness (TA) *[26,27]*

TA1: The comments on Douban are pretty much what I need to carry out my tasks.
TA2: Douban adequately meets my information needs.
TA3: Douban enhanced my effectiveness in finding suitable books.
TA4: Douban made the task I want to accomplish easier to get done.

Social attractiveness (SA) *[27,98]*

SA1: It is conductive to interact with other members through Douban.
SA2: It is easy to interact with other members through Douban.
SA3: Douban helps me to form warm relationships with other members.
SA4: Douban gives me the opportunity to recommend ideas to other members.

Physical attractiveness (PA) *[26,27]*

PA1: The design (*i.e.*, colors, boxes, menus, *etc.*) of Douban is attractive.
PA2: Douban looks professionally designed.
PA3: The overall look and feel of Douban is visually appealing.
PA4: Douban is visually pleasing.

Community Involvement (CI) *[16]*

CI1: Participating in Douban is one of the most enjoyable things I do.
CI2: Participating in Douban is important to me.
CI3: Participating in Douban is pleasurable to me.
CI4: Participating in Douban means a lot to me.

Social Commerce Engagement (SCE) *[48]*

SCE1: I am engaged in writing reviews in Douban.
SCE2: I often participate in online activities in Douban.
SCE3: I frequently read book comments in Douban.

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