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## Article

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# The role of online interaction in user stickiness of social commerce: The shopping value perspective

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## ABSTRACT

Recent studies indicate that online interactions generate significant effects on consumer behavior, such as customer loyalty and satisfaction, through shopping values, while there are only very few studies devoted to user stickiness. Therefore, the purpose of this paper is to contribute to the existing literature by analyzing the effects of online interactions on user stickiness in a social commerce environment through the perspective of shopping values. This study measures online interactions through perceived ease of use, perceived usefulness and social interactivity. Shopping values are evaluated by both utilitarian and hedonic values. Then a Stimulus (S)-Organism (O)-Response (R) model that relates online interaction, shopping values and user stickiness, is constructed to derive several research hypotheses. Based on 183 valid questionnaires the results reveal that perceived ease of use and social interactivity can positively affect utilitarian shopping values and user stickiness, while perceived usefulness and social interactivity positively affect hedonic shopping values and then influence user stickiness. Hence, online interactions play a crucial role in strengthening user stickiness in social commerce. Therefore, for social commerce platforms, managers need to continue improving their perceived ease of use, perceived usefulness and social interactivity to attract and retain their users.

## 1. Introduction

The development of digital business and ecommerce greatly affect our life styles and performance of firms (Hanafizadeh & Kim, 2020; Hanafizadeh, Shafia, & Bohlin, 2021). According to *Forward-The Economist* (2020a, 2020b), the transaction scale of ecommerce in China exceeded \$ 33.76 trillion at an annual growth rate of 6.7%. >710 million people are users of online purchase, which takes up 78.6% of total netizens in China. After the flourishing expansion, ecommerce finally reached its plateau period (Kumar, Lim, Pandey, & Christopher Westland, 2021). Various innovative approaches are taken to break bottlenecks and strengthen user stickiness, and social ecommerce is one of such innovative approaches and now it is becoming increasingly prevalent. Statistics show that the number of users of social commerce reached 713 million by the end of 2019, achieving an annual growth rate of 17.26%. Benefitting from the market expansion, the transaction scale of social commerce climbed to 2 trillion at an annual growth rate of over 70% since 2015 (Forward-The Economist, 2020a, 2020b).

Social commerce, an innovative mode of ecommerce, largely depends on the development of mobile online purchase and social interactions (Yin, Wang, Xia, & Gu, 2019). One major attribute that draws the difference between social commerce and traditional ecommerce is online interaction. Different from traditional online businesses, social commerce provides an information sharing platform for users and operators. Users can have access to a lot of information in social commerce and make better use of competing views when making decisions, while operators can discover and integrate valuable information to optimize their business ((Kanani & Glavee-Geo, 2021; Wang, 2012). In this regard, social commerce integrates the advantages of both ecommerce and social media, as social media can be used to effectively enhance the relationship between different parties (Sedalo, Boateng, & Kosiba, 2022).

User stickiness refers to the ability of a platform to attract or retain customers so that they continue to watch advertisements or repurchase on original brands (Lin, 2007). According to Reichheld and Schefter (2000) 5% increase in the user retention rate can lead to 25%–95%

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increase in the profit ratio. Therefore, it is quite important for e-commerce to strengthen user stickiness. As the consumer gradually focuses on the perceived shopping value during the process of purchase, this field is vital in increasing user stickiness (Nafees, Cook, Nikolov, & Stoddard, 2021).

The concept of shopping value can be defined as a trade-off between benefit and sacrifice. In particular, it describes the satisfaction of shopping motivations and the specific benefits that customers receive (Sánchez-Fernández & Iniesta-Bonillo, 2007). In social commerce, it is the online interaction that determines the consumer shopping value, and then affects consumers' behavior in the purchase process.

Numerous studies were devoted to the theme of social commerce. For example, Nie (2020) investigates the nexus between online interactions and customer purchase intentions. However, few scholars have studied the effects of online interactions in a social commerce environment (Geng, Wang, Chen, Song, & Yu, 2020). Furthermore, there is still a research gap in the field of user stickiness, especially in the perception of shopping values (Adapa, Fazal-e-Hasan, Makam, Azeem, & Mortimer, 2020; Karjaluoto, Shaikh, Saarijärvi, & Saraniemi, 2019). Based on the literature review of social commerce, online interaction, shopping value and user stickiness, several findings can be identified. First, there is a research gap between user stickiness and online interaction. The influence of online interaction on user stickiness has been omitted for a long time because social commerce has not attracted attention until recently. Second, the prior literature mainly studies the influence of perceived shopping on offline environment such as catering industry and tourism industry. The nexus between social commerce and perceived shopping value still requires further and more detailed investigation. Therefore, this paper analyzes the influence of online interaction on user stickiness from perceived shopping value perspective. We intend to enrich the existing research as well as offer practical suggestions to social commerce platforms.

Therefore, the main research objective of this paper is to study the effects of online interactions on user stickiness in social commerce from the shopping value perspective. The paper attempts to answer the following primary research question: what are the key factors influencing user stickiness in social commerce? More specifically, we look at the impact of online interactions (measured by perceived ease of use, perceived usefulness and social interactivity) on shopping values (measured by utilitarian and hedonic shopping values), and further impact on user stickiness.

A Stimulus-Organism-Response (SOR) model explaining the relationships between online interaction, shopping values and user stickiness is used to derive a number of empirically testable research hypotheses. Finally, several multiple linear regressions are run using individual survey data based on collected 183 valid questionnaires to test the hypotheses.

This study reveals that perceived ease of use and social interactivity can positively affect the utilitarian shopping value and influence user stickiness, while perceived usefulness and social interactivity positively affect the hedonic shopping value and then influence user stickiness. Therefore, online interactions play a crucial role in strengthening user stickiness of social commerce. Furthermore, several recommendations are provided to help businesses form competitive edge and gain long term profits in their industry. In particular, for social commerce platforms, operators need to continue improving their perceived ease of use, perceived usefulness and social interactivity to attract and retain their users.

The structure of this paper is as follows. In the next section we survey the relevant literature that explains basic concepts used in this study. Then, we describe our analytical framework based on the SOR theory and derive our research hypotheses. Subsequently, we discuss the properties of the dataset we use to validate the research hypotheses. In the next section, we report and interpret our empirical results. Then we discuss practical implications of our results. The last section summarizes and concludes with limitations of the study and guidelines for future

research.

## 2. Literature review

### 2.1. Growth and classification of social commerce

The birth of social commerce can be traced back to the 1990s when web-based businesses started flourishing. At that time, the Internet was used in e-commerce to construct social communication and cooperation with user clusters. The term 'social commerce' was not officially introduced until Yahoo did it in 2005 (Esmaili & Hashemi, 2019). The research on social commerce mainly focuses on two perspectives: i) personal experience and ii) social activities. In the context of personal experience, Zhang, Lu, Gupta, and Zhao (2014) argue that there is a two-way relationship between social commerce and virtual experience of customers. Hajli (2013) discovers that social commerce affects consumer trust and motivates purchase intentions of consumers. In the context of social activities, Lu, Lu, Lin, and Qi (2014) study the effects of user evaluation and online communication on social commerce.

Social commerce is an online platform that allows users to achieve online collaboration. People can get shopping feedbacks from trusted ones and purchase their target goods through the website (Tian, 2013). In other words, social commerce is the combination of commerce and social behaviors. As social commerce develops, business modes of social commerce evolve. Hence, many studies were carried out to classify the business modes. Various classifications are summarized in Table 1. Considering the timeliness of different classification standards, this paper chooses the one offered by Linkshop. (2019) to classify prevalent social commerce platforms. The full classification of Linkshop. (2019) is shown in Table 1 below.

Table 2 below summarizes the most recent publications on social commerce.

### 2.2. Online interactions and their measurement

Online interaction is a form of social interaction defined as information exchange and transmission based on the computer and the Internet (Rafaeli & Sudweeks, 1998). Both social and online interactions reflect communication that happens between people. Social interactions happen through fact-to-face communication, while online interactions take computer and Internet as intermediaries of communication. Online interactions overcome the inconvenience brought by locations, time, institution etc. Benefitting from online interactions, the range and the means of communication are largely expanded.

According to previous studies, there are various means of classifying

**Table 1**  
The Collection of Current Social Commerce in China.

Sources	Classification Standard	Classification	
		Name of Classifications	Examples
Tian (2013)	Business Model	Social Interest Model	MOGU
		Pinterest Model	Duitang
		Media Shopping Guide Model	Taobao
		Forum Model	Hers
Wei (2019)	Operation Model	Wholesale Model	Pinduoduo
		Distribution Model	YUNJI
		SAAS Model	Youzan
		Content Model	Xiaohongshu
Linkshop. (2019)	Operational Logic	Membership Distribution Model	YUNJI
		Group Buying Model	Pinduoduo
		Content Sharing Model	Xiaohongshu
		Wanghong Live Model	Taobao
		Community Group	NICETUAN
		Booking Model	

Source: own elaboration by the authors.

**Table 2**  
Summary of Recent Publications on Social Commerce.

Authors and Years	Research Question	Data	Conclusion
Doha, Elnahla, & McShane (2019)	The purpose of this paper is to investigate the factors that influence individuals' behavioral intention toward social commerce.	quantitative data from 193 university students	The pursuit of socialization was the main driver for consumers' behavioral intention toward social commerce services
Sheikh, Liu, Islam, Hameed, & Khan (2019)	The purpose of this paper is to investigate the influence of social commerce constructs (SCCs), social support and relationship quality on social commerce intentions, which lead to use behavior of social networking sites for social commerce.	343 users of social networking sites in Pakistan	SCCs and relationship quality have a significant impact on social commerce intentions. The impact of social support could not positively influence the relationship quality with the social networking site. However, social support influences the social commerce intentions significantly.
Peng, Zhang, Wang, & Liang (2019)	This study investigates the role of time pressure and product involvement in the relationship between perceived value and purchase intention.	survey data from <a href="http://wjx.com">wjx.com</a> in China	This paper found that perceived value is positively related to purchase intention, whereas time pressure negatively moderates the effect of emotional/social value on purchase intention. The three-way interaction among time pressure, perceived functional/emotional/social value, and product involvement was also statistically significant.
Bugshan & Attar (2020)	This study investigates the influence of trust in sharing commerce, social commerce information sharing, and perceived privacy risk on the intention to buy.	400 people in different social media and social commerce communities in Asia	Social commerce information sharing activities increases the trust in sharing commerce platforms and reduces perceived privacy risk, which can significantly improve the decision-making process and the intention to buy.
Wongkitrungrueng & Assarut (2020)	This paper proposes a comprehensive framework with which to examine the relationships among customers' perceived value of live streaming, customer trust, and engagement.	261 Bangkok-based respondents who had experienced watching Facebook Live videos to sell fashion products	Symbolic value is found to have a direct and indirect effect via trust in sellers on customer engagement, while utilitarian and hedonic values are shown to affect customer engagement indirectly through customer trust in products and trust in sellers sequentially.
Molinillo & Anaya-Sánchez (2020)	This study explores the influence of social support and community factors on customer engagement and the subsequent effects on customer loyalty toward social commerce websites	data from 437 users of Facebook social commerce websites	The findings show that customer engagement is a key predictor of the four dimensions of customer loyalty toward social commerce websites. In addition, the results indicate that social support and two community factors significantly affect customer engagement.
Tajvidi, Wang, Hajli, & Love (2021)	This study investigates the factors that affect consumers' intention to engage in brand value co-creation activities and provides an underlying understanding of how customers engage in brand value co-creation activities within social commerce context.	Empirical data was collected from the brand pages from a social networking website in China.	The results demonstrate that interactivity, specifically, consumer-consumer interaction and consumer-seller interaction, positively affects social support, which in turn enhances consumers' intention to co-create brand value.
Hsiao (2021)	The purpose of this study is to examine the effect of interpersonal competency on social commerce behavior through customer-perceived value.	Data collected from 255 active young consumers of college students of full time and part time at a university who have used social media	The findings show the effect of interpersonal competence on customer-perceived value. Moreover, they also demonstrate the effect of the utilitarian value and social value on behavioral intention toward social commerce, recognizing the importance of functional utility of commerce activities and social utility of social media use in social commerce.
Zafar, Qiu, Li, Wang, & Shahzad (2021)	This study investigated the influence of celebrities' post authenticity, sentiment polarity, observational learning, and impulse buying tendency following the latent state-trait theory.	452 Pakistani respondents collected via an online questionnaire from celebrities' community on Facebook.	The findings revealed that proposed constructs significantly influence the urge to buy impulsively. Further, impulse buying tendency moderates all relationships except negative sentiments. Unexpectedly, the moderation effects of celebrities' authenticity are insignificant.
Hossain, Rahman, & Zhou (2021)	The purpose of this study is to measure the impact of customers' interpersonal interactions in social commerce on customer relationship management (CRM) performance, based on the flow, commitment-trust and stimulus-organism-response (SOR) theories.	640 users of social commerce through a web questionnaire during the COVID-19	Results of the current study reveal that customers' interpersonal interactions in social commerce optimistically influence their perceived flow. Moreover, perceived flow absolutely controls users' trust and CRM performance. In turn, collective users' trust positively influences users' commitment and CRM performance. Finally, collective users' commitment absolutely influences the performance of CRM.

Source: own elaboration by the authors.

online interactions. For example, Hoffman and Novak (1996) divide online interaction into machine and personal interactivity when studying the marketing strategy in computer mediated environment. Ha and James (1998) also divide internet interaction into two dimensions: computer-mediated communication and interpersonal communication. Fan (2007) measures online interactivity through four aspects: i)

interactive place, ii) interactive feature, iii) interactive channel and iv) interactive content. Zhao and Lu (2010) evaluate interactivity through five aspects: i) interoperability, ii) ease of use, iii) telepresence, iv) enjoyment and v) intimacy. Ning, Zhang, and Liu (2013) apply a three-dimensional method to scale interactivity includes: i) interpersonal distance, ii) interactive content, iii) interactive channel.

This paper employs the two-dimensional method to evaluate online interaction from the aspects of computer-mediated communication and interpersonal communication. Computer-mediated interaction refers to the communication between users and social commerce platform. It mainly focuses on the customer experience of convenience and effectiveness when using the platform (Kohler, Rohm, Ruyter, et al., 2011). According to TAM model (Technology Acceptance Model) which is originated from users' acceptance of the information system, many scholars use the perceived ease of use factor and perceived usefulness to evaluate the computer-mediated interaction (Wu, Ling, & Wang, 2011). Interpersonal interaction contains the social interactivity among users (Hughes & Ahearne, 2010). Therefore, social interactivity is mainly used to study interpersonal interaction. The two-dimensional method is summarized in Table 3.

2.3. Shopping value in ecommerce

According to Babin, Darden, and Griffin (1994), the shopping value provided to consumers in the retail field contains two categories: utilitarian and hedonic shopping values. The utilitarian shopping value often results from conscious and task-related shopping experiences. It can be viewed as the outcome of a more goal-oriented, rational and non-emotional shopping. In contrast, the hedonic shopping value results from a more spontaneous, irrational and emotional shopping trip. It can be received from increased arousal, fantasy fulfillment and escapism (Babin et al., 1994; Chen & Yeong, 2014; Jones, Reynolds, & Arnold, 2006). Antecedents to utilitarian and hedonic shopping values reveals their importance to online shopping. Bridges and Florsheim (2008) report that online customers may seek utilitarian benefits like ease of use and hedonic benefits like enjoyment while using online platforms. Moreover, it is worth noting that hedonic shopping values are gaining more weight nowadays as users are focusing more on online experience. Childers, Carr, Peck, and Carson (2001) observe that pleasure and immersive aspect of online platform is appreciated, while the convenience and clear navigation, which are indicated in the utilitarian shopping value, are also important factors for users.

2.4. User stickiness

User stickiness relies on users' feelings and experience toward a website. It is indicated in behaviors such as repeated visiting and using of the target website without considering replacement (Zhou, 2015). Recently, user stickiness is gaining attention from ecommerce operators owing to its key influence on profitability. Studies are focusing not only on web users' revisit willingness, but also on their time of visiting. The transfer of research attention happens because operators have recognized that their sales increase as the time of customers' stay extends (Lin, 2007).

User stickiness is often regarded as a single-dimensional variable. Thus, the differences in measurements only appear in the number of indicators and content. User stickiness indicators can be divided into two main categories that include behavior and result indicators. The behavior indicators contain indicators such as page views, page click rates, the time and frequency of a visit (Lin, 2007). The result indicators include indicators like purchase or re-purchase intention (Khalifa, Limayem, & Liu, 2002). The latter indicators are often used when evaluating traditional ecommerce. Therefore, the behavior indicators

**Table 3**  
Dimensions of Online Interaction and Corresponding Research Factors.

Scale of Interaction	Research Factors
Computer-mediated Interaction	Perceived Ease of Use, Perceived Usefulness
Interpersonal Interaction	Social Interactivity

Source: own elaboration by the authors.

are used in this study to distinguish social commerce from traditional ecommerce. As Du (2009) suggests the measures of user stickiness include: i) the frequency of a web visit, ii) the extent of deep reading, iii) interactivity between users and websites or users, and iv) users' recognition toward brands. Therefore, indicators for user stickiness are extracted to refer to these studies.

3. Theory review and hypotheses

3.1. Conceptual model

In this paper we employ the SOR model as our analytical framework. The SOR model combines the external and internal factors to measure human behavior. It consists of three components: a stimulus (S), an organism (O) and a response (R). According to Mehrabian and Russell (1974), when measuring shopping behavior, the external factor (environment stimuli) will first lead to inner organism changes and then results in behavior responses.

Along with the emergence of ecommerce, the SOR framework has been successfully extended to include the field of online shopping. For example, Kawaf and Tagg (2012) apply the SOR model to study factors that affect fashion shopping behavior. Chen and Yeong (2014) use the SOR framework to study the effect of consumers' motives on online shopping behavior. Their studies show that the SOR model can be used to study the ecommerce in China. More recently, Desaid (2019) applied the SOR model to investigate the effects of personalization on cognitive and hedonic shopping values, which determine user satisfaction and stickiness to a particular website. Therefore, basing on the prior literature, this study uses the SOR model as the analytical framework for our empirical study to examine the factors influencing user stickiness in social commerce. The original SOR model is shown in Fig. 1.

Basing on the prior literature, computer-mediated interaction includes the perceived ease of use and perceived usefulness and interpersonal interaction includes social interactivity. Therefore, these three factors constitute the set of environmental stimuli. Hedonic and utilitarian shopping values represent the two aspects of the organism. The response is indicated as user stickiness. The specific research framework is shown in Fig. 2.

3.2. Hypotheses development

The functional design of website is a vital factor deciding the users' online experience. Higher the level of website interactivity leads to higher the consumer appraisal. Basing on the prior literature, this study evaluates the computer-mediated interaction from two dimensions: perceived ease of use and perceived usefulness. Perceived ease of use (PEOU) is defined as the extent to which users feel effortless during online shopping (Chiu, Wang, Fang, & Huang, 2014). A more customer-oriented online platform makes it much easier to communicate and complete a transaction and thus, more likely to positively influence consumer attitude during purchase. An easy-to-use online platform allows customers to complete their purchase quickly, which also guarantee their shopping pleasure. As a result, customers' utilitarian and hedonic shopping are increased. Yang (2010) investigated the effect of perceived ease of use, in which it was defined as effort expectancy on mobile shopping. A 400-participant survey indicated that perceived ease of use had a significant positive effect on both the utilitarian and hedonic shopping values. According to Avclar and Özsoy (2015), perceived ease of use indicates a significant positive impact on the hedonic shopping value under the environment of online shopping. Therefore, based on the prior literature, the following hypotheses about perceived ease of use can be proposed:

**H1a.** Perceived ease of use has a significant positive impact on utilitarian shopping value.

**H1b.** Perceived ease of use has a significant positive impact on hedonic

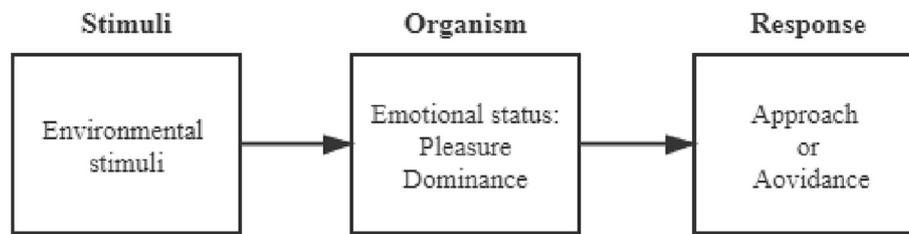


Fig. 1. General Framework of SOR Model.  
Source: Mehrabian and Russell (1974).

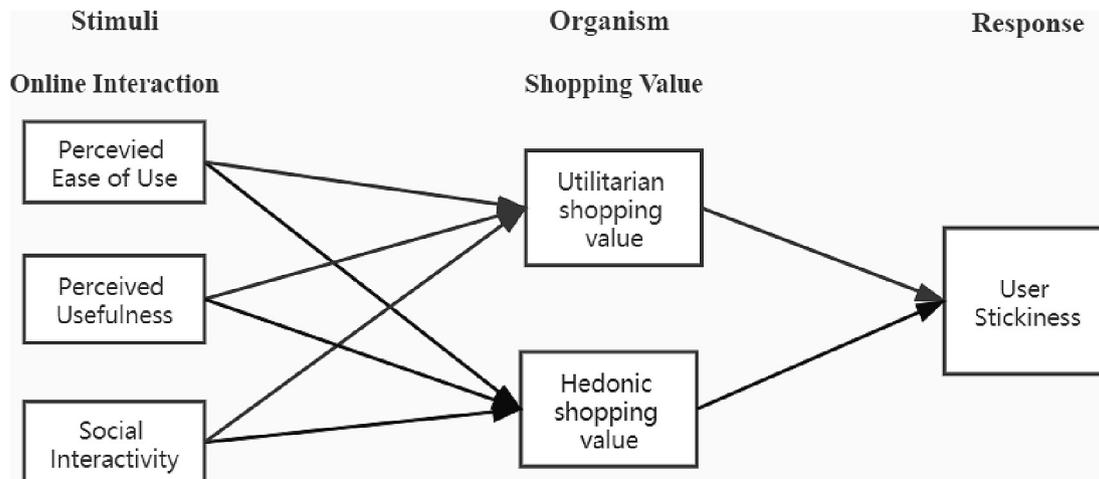


Fig. 2. Detailed Analytical Framework.  
Source: Own elaboration by the authors.

shopping value.

As for the second dimension of measuring computer-mediated interaction, perceived usefulness (PU) refers to the extent to which a consumer believes that online shopping would improve his or her transaction performance (Chiu et al., 2009). The clear design of a website offers its users an easy access to various information, therefore the platform can guarantee users' needs to a great extent, leading to the increase in the utilitarian shopping value. In addition, an online platform with various useful information reduces users' search time, which increases their shopping satisfaction and then raises their hedonic shopping values. The increased perceived usefulness helps reducing perceived risk as well as increasing the hedonic value, leading to a higher probability of customers converting information-collecting websites into transaction channels (Zhao, 2015). Various studies demonstrate that perceived usefulness is the primary factor affecting a customer' continuous use of technology. Childers et al. (2001) applied the TAM framework to study the influence of perceived usefulness. Their results showed that perceived usefulness could positively affect customers' attitude in a utilitarian shopping environment. On the basis of the aforementioned studies the following hypotheses can be proposed:

**H2a.** Perceived usefulness has a significant positive impact on utilitarian shopping value.

**H2b.** Perceived usefulness has a significant positive impact on hedonic shopping value.

Social interactivity is applied to measure interpersonal communication in online interactions. A timely and comprehensive communication helps users to better adapt to an environment (Steuer, 1992). In a virtual society built by social commerce, users can share their shopping or using experiences conveniently. In time information exchange prevents users from spending time and energy on filtering unnecessary

information, which increase their utilitarian shopping value. A fully constructed social interacting environment offers users an opportunity to share their emotions and extend interpersonal relationships, therefore users' hedonic shopping value is also strengthened. The benefits brought by interpersonal interactions can help to increase the perceived shopping values in both utilitarian and hedonic ways (Tu & Chen, 2015). Apart from that, users are able to find their virtual communities through social interactivity, where endows them with belongingness and reduces communication barriers. Based on the findings of these studies the following hypotheses can be proposed:

**H3a.** Social interactivity has a significant positive impact on utilitarian shopping value.

**H3b.** Social interactivity has a significant positive impact on hedonic shopping value.

The shopping values consumers can gain affect their shopping behaviors. As indicated in the SOR model, user stickiness is the response consumers made through the organism of utilitarian and hedonic shopping values. Various studies indicate that high levels of perceived utilitarian and hedonic shopping values, resulting from shopping experience, can lead to behaviors like repeat purchases or continuous usage (Ozturk, Nusair, Okumus, & Hua, 2016). On the one hand, an online platform that brings high utilitarian shopping values can meet users' needs to a great extent. Users will continue to use this platform due to its convenience and comprehensiveness. On the other hand, high hedonic shopping values enable retailers to offer an amazing and immersive discovery-based shopping experiences. This outstanding shopping experience will eventually increase customers' repurchase rate. According to Kim (2013) significant positive relationships exist between utilitarian and hedonic values and mobile phone continuous engagement. A pleasant shopping experience motives good mood inside customers, which results in a longer time of an immersed shopping trip

(Hoffman & Novak, 1996). According to Babin and Attaway (2000), consumer choose to spend more time and energy if the shop can offer a higher utilitarian shopping value. On the basis of the aforementioned studies, the following hypotheses can be proposed:

**H4.** Utilitarian shopping value has a significant positive impact on user stickiness.

**H5.** Hedonic shopping value has a significant positive impact on user stickiness.

To be more specific, these hypotheses are displayed in the theoretical model shown in Fig. 3.

3.3. Questionnaire development and data collection

The questionnaire was launched through the Internet. In order to increase the diversity of collected samples, the questionnaire was distributed through different online channels:

- (1) The questionnaire was sent to the authors' high school or college schoolmates, relatives and friends through Wechat, QQ and email.
- (2) The questionnaire was distributed through several online social platforms includes Weibo, Xiaohongshu etc.
- (3) The questionnaire was designed and launched though WJX questionnaire platform.

211 copies were recovered, in which 28 questionnaires were invalid due to the high ratio of answer repetition (the repetition ratio that was above 80%). As a consequence, there are 183 valid questionnaires used in the following analysis with an effectiveness questionnaire returns-ratio of 86.73%. Also, in order to overcome the common method bias, some respondents were randomly selected and interviewed and some others were randomly selected and asked to redo the survey, to double check if their answers are robust and consistent.

The questionnaire was organized into different parts to collect information influencing user stickiness in the form of five-point Likert scales. The five options are “strongly disagree”, slightly disagree, “normal”, “slightly agree” and “strongly agree”, align with 1, 2, 3, 4, and 5, respectively. The first part contains basic information that respondents need to provide including gender, age, income level, educational background and daily used social commerce application. The second part measures the dependent, independent and mediator variables with three questions each. The questionnaire structure is listed in Table 4.

For dependent variable, this study selects three questions including

“the likelihood of maintaining or increasing the frequency of visiting to the platform”, “the willingness of continuous engagement of using the platform” and “the willingness of recommending the platform” to measure the user stickiness of social platforms.

For independent variables, perceived ease of use, perceived usefulness and social interactivity are used to measure online interactions. Perceived ease of use and perceived usefulness belong to the category of computer-mediated interactions, while social interactivity measures interpersonal interactions. For the mediator variable, utilitarian and hedonic shopping values are applied as the organism of the SOR theory.

The control variables used in this study include individual characteristics such as biological gender, age, monthly disposable income, and an education level. As the lack of control for these variables may bias the regression results, they are added in the correlation and regression analysis to eliminate the potential bias.

4. Data and results

The empirical study uses STATA to analyze the sifted 183 questionnaires. The empirical analysis follows four steps. First, a descriptive analysis is displayed to demonstrate the sample features and user behavior toward social commerce platforms. Second, a reliability analysis is carried out to test the reliability of data. Third, the validity analysis is used to indicate the fitting degree between variables and the measured indicators. Fourth, the multiple regression analysis is used to test the research hypotheses. Finally, we study the robustness of our results using the structural equation modelling (SEM) approach.

4.1. Descriptive statistics

Based on the survey, the demographic profile of the respondents is shown Table 5. Women constitute the majority of the sample, taking an account of 78.69%, while men account for only 21.31%. As seen from the age distribution, >74% of the respondents are aged between 18 and 25 years old. People of this age are the main users of online purchase and interaction. As for monthly disposable income, over 40% of respondents earn <1000 yuan per month, while data collected across other income groups is spread evenly. In the aspect of academic degrees, about 2% of the sample finished a high school or below, 6.56% of the respondents are masters or doctors, and 91.26% of the respondents are college graduates or bachelors. According to occupation statistics, nearly 70% of respondents are students, followed by office workers (21.86%). About 7.10% of the sample are self-employed people. There is one job seeker and one respondent at other job condition.

Table 6 describes the user penetration of different social commerce platforms. Collected data indicates that the group buying model, the

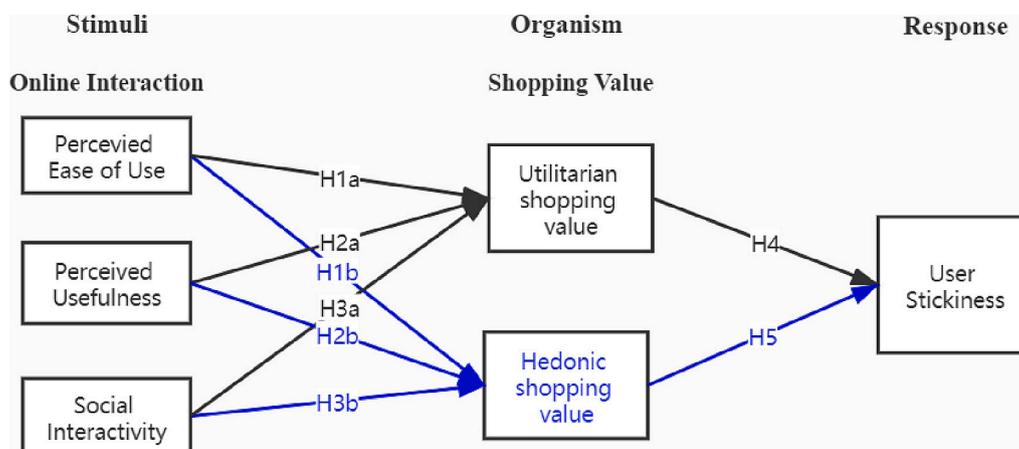


Fig. 3. Research Hypotheses. Source: Own elaboration by the authors.

**Table 4**  
Questionnaire Design.

Measuring Factor	Question Code	Measuring Question	Reference
Perceived Ease of Use	PEOU1	The functions set by the social e-commerce platform are simple and easy to learn and operate.	Davis (1989)
	PEOU2	I know how to use the platform efficiently.	
	PEOU3	I can quickly find the product information I need through the index of different sections	
Perceived Usefulness	PU1	The platform is accurately positioned and will provide me with sufficient product information.	Davis (1989); Gefen and Straub. (2003)
	PU2	The platform will provide information that meets my preferences based on my browsing and purchase records.	
	PU3	The platform will provide me with information includes exciting discounts and new product launches etc.	
Social Interactivities	SI1	I will join various interest communities or circles set up on the platform, read posts, follow posts, or build relationships with other users.	Hoffman and Novak (1996); McMillan and Hwang (2002); Fan (2007)
	SI2	I will comment, reply, like or share the buyer's show or moments posted by other users on this platform.	
	SI3	I will follow community experts or users with other common interests on the platform, check their latest developments and visit their personal homepages.	
Utilitarian Shopping Value	USV1	I think the products recommended by the platform or users have good quality and are trustworthy.	He, Han, and Li (2014)
	USV2	I think the platform or user helped me choose the right product, which is a good bargain.	
	USV3	I think the interactive features set by the platform are attractive and exactly what I want.	
Hedonic Shopping Value	HSV1	Browsing through the platform when I'm bored makes me happy.	Wu and Tsang (2008)
	HSV2	It's fun to browse, express opinions, discuss and communicate with other users on this platform.	
	HSV3	Participating in topic comments and other activities on the platform makes me feel relaxed and happy.	
User Stickiness	US1	In the future, I will maintain or increase the frequency of visits to the platform, and even extend the stay time	Wu and Tsang (2008)
	US2	I feel satisfied with the platform I am using and unwilling to change to other platforms.	
	US3	I will recommend this social commerce platform to my relatives and friends.	

Source:Own elaboration by the authors.

**Table 5**  
The Demographic Profile of Respondents.

Variable	Option	Frequency	Percentage (%)
Biological Gender	Male	39	21.31
	Female	144	78.69
Age	Under 18	1	0.55
	18–25	137	74.86
	26–30	20	10.39
	31–40	17	9.29
	41–50	4	2.19
	Above 50	4	2.19
Monthly Disposable Income	Under 1000 yuan	59	48.76
	¥ 1000–2000	19	15.70
	¥ 2000–4000	17	14.05
	¥ 4000–6000	12	9.92
	Above 6000 yuan	14	11.57
Education	High school or below	4	2.19
	College degree/Bachelor's degree	167	91.26
	Master's degree or above	12	6.56
	Student	128	69.95
Current Occupation	Freelance work/Self-employed people	13	7.10
	On job	40	21.86
	Between jobs/Retired	1	0.55
	Others	1	0.55
Total		183	100

Source:Own elaboration by the authors.

**Table 6**  
Frequency Analysis of Participants' Used Social Commerce Platforms.

Items	Categories	N	Percent (%)
Membership distribution model: YUNJI, BEIDIAN, Mengniu Dairy, Gome, Wahaha, SIBU etc.	unchecked	147	80.33
	checked	36	19.67
Group buying model: Pinduoduo, Suning, JD etc.	unchecked	45	24.59
	checked	138	75.41
Wanghong live model: Taobao live show, Tik Tok, Kuaishou, MOGU etc.	unchecked	72	39.34
	checked	111	60.66
Content sharing model: Xiaohongshu, Xiaohongchun, Babytree etc.	unchecked	97	53.01
	checked	86	46.99
Community group booking model: NICETUAN, mryitao, The Good Life, Songshupinpin etc.	unchecked	168	91.8
	checked	15	8.2
Total		183	100

Source:Own elaboration by the authors.

Wanghong live model, and the content sharing model are the top three most used social commerce platforms. Most interviewees have experienced more than one kind of social commerce platforms. This result shows that interviewees have lots of experience with social commerce platforms. The participants are also asked to pick out the social commerce platform they had used. Different platforms are divided into five categories based on the study of Linkshop. (2019). For the membership distribution, 19.67% users show that they have the experience of using these websites. About 75.41% participants have shopping history on group buying platforms. As for the Wanghong live model, over 60% participants indicate that they use applications like Taobao, Tik Tok and Kuaishou, etc. There are nearly 50% of the interviewees demonstrate that they have used content sharing social commerce like Xiaohongshu. The least used social commerce platform is a community group booking platform like NICETUAN at a usage rate of only 8.2%.

**4.2. Reliability analysis**

The reliability analysis is used to test the consistency and stability of collected data (Wan, 2014). The Cronbach's Alpha Coefficient is universally used in the analysis to measure reliability. If the Cronbach's  $\alpha$  value is above 0.80, the data is of high reliability. If the Cronbach's  $\alpha$

value is between 0.6 and 0.7, the reliability is good. As can be seen from Table 7, the overall scale of the questionnaire is 0.884 which is higher than 0.7. Therefore, the data meet the necessary requirement. In detail, the Cronbach's Alpha Coefficient for each variable is over 0.7. Moreover, the coefficient for perceived usefulness is 0.541, which is acceptable. Therefore, the questionnaire meets the necessary requirement and is reliable.

4.3. Validity analysis

Validity refers to the degree that a theoretical model predicts the accuracy of the measured object (Wan, 2014). It can be divided into content and construct validity. As the questionnaire was formulated basing on the previous studies, content validity is ensured. In our study, the KMO & Bartlett's test is applied to measure the construct validity. KMO higher than 0.6 but lower 0.7 than indicates an acceptable validity. KMO between 0.7 and 0.8 refers to a good validity. The validity of data is unacceptable if KMO is lower than 0.6. Based on the output shown in Table 8, the validity of all variables is acceptable as their KMO values are greater than or equal to 0.6 with significance of all variables lower than 0.05. Therefore, the data collected is of required reliability and validity to proceed to the regressions analysis.

4.4. Pairwise correlations

To ensure the accuracy of the regression analysis, it is necessary to test for the potential multicollinearity between independent variables. Multicollinearity refers to the high correlation that may exist between independent variables, which can lead to the distortion of the estimated coefficients obtained from a linear regression model. This paper analyzes correlations among independent variables using the Pearson correlation model. The calculated values of pairwise correlations are reported in Table 9. For independent variables, there are only three correlation coefficients over 0.5, among which the coefficient between social interactivity and hedonic shopping value is the highest at 0.565. As all the correlation coefficients are <0.6 and the majority of them are <0.5, the calculated correlations between independent variables are generally low. This indicates that there is no multi-collinearity problem. Thereby, the data collected meets the requirements for further regression analysis.

4.5. Regression analysis

The multiple linear regression is a quantitative method used when there are at least two independent variables existing in a linear model. This regression analysis is capable of demonstrating the direction and the extent independent variables have on the dependent variable. The empirical study examines our hypotheses based on the regression analysis.

Table 10 reports the results of the regression analysis for the utilitarian shopping value. The R squared for the estimated model is 0.389, indicating that the three factors can explain 38.9% of the variation in the utilitarian shopping value. The VIF values of all variables are lower than

Table 7 Reliability Analysis.

Variable Category	Variable Name	Label	Cronbach α Value		
			Dimension	Variable	Total
Online Interaction	Perceived Ease of Use	PEOU1, PEOU2, PEOU3	0.718		
	Perceived Usefulness	PU1, PU2, PU3	0.541	0.769	
	Social Interactivity	SI1, SI2, SI3	0.808		
Shopping Value	Utilitarian Shopping Value	USV1, USV2, USV3	0.709		0.884
	Hedonic Shopping Value	HSV1, HSV2, HSV3	0.772	0.773	
User Stickiness	User Stickiness	US1, US2, US3	0.714	0.714	

Source:Own elaboration by the authors.

Table 8 Validity Analysis.

Variable	KMO	Bartlett's	Item	Factor Loading	Accumulative Variance Contribution
Perceived Ease of Use (PEOU)	0.671	0.000	PEOU1	0.797	63.953%
			PEOU2	0.830	
			PEOU3	0.771	
Perceived Usefulness (PU)	0.600	0.000	PU1	0.783	52.549%
			PU2	0.735	
			PU3	0.651	
Social Interactivity (SI)	0.713	0.000	SI1	0.844	72.325%
			SI2	0.845	
			SI3	0.863	
Utilitarian Shopping Value (USV)	0.693	0.000	USV1	0.798	63.325%
			USV2	0.825	
			USV3	0.764	
Hedonic Shopping Value (HSV)	0.668	0.000	HSV1	0.760	68.730%
			HSV2	0.854	
			HSV3	0.870	
User Stickiness (US)	0.679	0.000	US1	0.807	63.747%
			US2	0.800	
			US3	0.788	

Source:Own elaboration by the authors.

5, demonstrating that there is no multi-collinearity problem in this model. As the *p*-value of perceived usefulness factor is 0.176 > 0.1, the perceived usefulness shows a significant effect on the utilitarian shopping value. As the estimated coefficient on the perceived ease of use is 0.238 (*t* = 3.624, *p* = 0.000 < 0.01), this factor has a significant positive effect on the utilitarian shopping value. Moreover, the estimated coefficient on social interactivity is 0.271 (*t* = 6.328, *p* = 0.000 < 0.01), which also indicates that social interactivity can positively affect the utilitarian shopping value. As a result, the H1a, H3a cannot be rejected, while H2a is rejected.

Table 11 shows the results of the regression analysis for the hedonic shopping value. As the VIF value of each factor is lower than 5, the multi-collinearity problem does not exist in this model. Based on the following regression output, the R squared for this model is 0.413, demonstrating that these three independent variables can explain 41.3% of the variation in the hedonic shopping value. The estimated coefficient on perceived ease of use is 0.063 (*t* = 0.788, *p* = 0.4 > 0.1), manifesting that perceived ease of use does not influence the hedonic shopping value in this model. The regression coefficients on perceived usefulness and social interactivity are 0.257 (*t* = 2.787, *p* = 0.006 < 0.01) and 0.363 (*t* = 6.985, *p* = 0.000 < 0.01) respectively, demonstrating that perceived usefulness is positively correlated with the hedonic shopping value and so do the social interactivity factor. As a result, H2b and H3b cannot be rejected, while H1b is rejected.

Table 12 shows the estimation results of using the utilitarian and hedonic shopping values as independent variables and user stickiness as the dependent variable. Judging from VIF values, there is no multi-collinearity problem in the model. As shown by the R squared, the utilitarian shopping value and hedonic shopping value can explain 45.2% of the variation in user stickiness. The estimated coefficients on the utilitarian and hedonic shopping values are 0.436 (*t* = 6.200, *p* =

**Table 9**  
Correlation Analysis between Independent Variables.

(Pearson Correlations)											
	Mean	Std. Deviation	G	A	E	MDI	PEOU	PU	SI	USV	HSV
G	1.787	0.411	1								
A	2.443	0.917	-0.127*	1							
E	2.044	0.293	-0.013	0.03	1						
MDI	2.634	0.979	-0.017	0.426***	0.018	1					
PEOU	3.845	0.686	0.207***	-0.033	-0.066	0.051	1				
PU	3.829	0.593	0.173**	-0.035	-0.052	-0.014	0.541***	1			
SI	3.175	0.963	0.076	0.297***	-0.001	0.165**	0.254***	0.276***	1		
USV	3.612	0.628	0.026	0.211***	-0.037	0.194***	0.408***	0.339***	0.534***	1	
HSV	3.494	0.777	0.217***	0.234***	-0.015	0.049	0.298***	0.373***	0.565***	0.420***	1

Notes: G, Gender; A, Age; E, Education; MDI, Monthly Disposable Income; PEOU, Perceived Ease of Use; PU, Perceived Usefulness; SI, Social Interactivity; USV, Utilitarian Shopping Value; HSV, Hedonic Shopping Value.

\*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

Source:Own elaboration by the authors.

**Table 10**  
Regression analysis of utilitarian shopping value.

Parameter Estimates (n = 183)											
Model		Unstandardized Coefficients		Standardized Coefficients	T	p	VIF	R <sup>2</sup>	Adj R <sup>2</sup>	F	
		B	Std. Error	Beta							
Constant		1.469	0.414	-	3.549	0.000***	-				
Independent Variables	PEOU	0.238	0.066	0.26	3.624	0.000***	1.478				
	PU	0.103	0.076	0.097	1.358	0.176	1.475				
	SI	0.271	0.043	0.416	6.328	0.000***	1.236	0.389	0.364	$F(7,175) = 15.903, p = 0.000$	
	G	-0.105	0.093	-0.069	-1.125	0.262	1.071				
Control Variables	A	0.036	0.047	0.053	0.766	0.444	1.358				
	E	-0.038	0.127	-0.018	-0.304	0.762	1.006				
	MDI	0.057	0.042	0.09	1.366	0.174	1.233				

Dependent Variable: USV

Notes: G, Gender; A, Age; E, Education; MDI, Monthly Disposable Income; PEOU, Perceived Ease of Use; PU, Perceived Usefulness; SI, Social Interactivity; USV, Utilitarian Shopping Value.

\*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Source:Own elaboration by the authors.

**Table 11**  
Regression Analysis of Hedonic Shopping Value.

Parameter Estimates (n = 183)											
Model		Unstandardized Coefficients		Standardized Coefficients	t	P	VIF	R <sup>2</sup>	Adj R <sup>2</sup>	F	
		B	Std. Error	Beta							
Constant		0.444	0.502	-	0.886	0.4	-				
Independent Variables	PEOU	0.063	0.08	0.055	0.788	0.4	1.478				
	PU	0.257	0.092	0.196	2.787	0.006***	1.475				
	SI	0.363	0.052	0.45	6.985	0.000***	1.236	0.413	0.389	$F(7,175) = 17.577, p = 0.000$	
	G	0.297	0.113	0.157	2.622	0.010**	1.071				
Control Variables	A	0.144	0.057	0.17	2.514	0.013*	1.358				
	E	-0.005	0.154	-0.002	-0.03	1	1.006				
	MDI	-0.076	0.051	-0.095	-1.482	0.1	1.233				

Dependent Variable: HSV

Notes: G, Gender; A, Age; E, Education; MDI, Monthly Disposable Income; PEOU, Perceived Ease of Use; PU, Perceived Usefulness; SI, Social Interactivity; HSV, Hedonic Shopping Value.

\*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Source:Own elaboration by the authors.

0.000 < 0.01) and 0.376 ( $t = 6.402, p = 0.000 < 0.01$ ) respectively, so the utilitarian shopping value and hedonic shopping value are positively correlated with user stickiness. Hence, hypotheses 4 and 5 cannot be rejected.

Table 13 shows the estimation results for three independent variables and user stickiness as the dependent variable. As the VIF of all the variables are below 5, there is no multicollinearity problem in the model. The R squared for this model is 0.371, indicating that perceived

ease of use, perceived usefulness and social interactivity can explain 37.1% of the variation in user stickiness. The coefficient of three independent variables are 0.269, 0.223 and 0.250 respectively. With all the p values smaller than 0.01, these regression results indicate that all three variables have significant and positive effects on user stickiness. Therefore, strengthening the perceived ease of use, perceived usefulness and social interactivity of social commerce platforms can boost its user stickiness.

**Table 12**  
Regression Analysis of User Stickiness.

Parameter Estimates (n = 183)										
Model		Unstandardized Coefficients		Standardized Coefficients	t	P	VIF	R <sup>2</sup>	Adj R <sup>2</sup>	F
		B	Std. Error	Beta						
Constant		0.582	0.41	–	1.419	0.158	–			
Independent Variables	HSV	0.376	0.059	0.416	6.402	0.000***	1.357			
	USV	0.436	0.07	0.39	6.200	0.000***	1.271			
	G	0.08	0.1	0.047	0.798	0.426	1.095	0.452	0.433	F (6,176) =24.206, p = 0.000
Control Variables	A	–0.069	0.05	–0.09	–1.392	0.166	1.348			
	E	0.062	0.134	0.026	0.462	0.645	1.003			
	MDI	0.015	0.045	0.021	0.338	0.736	1.261			

Dependent Variable: US

D-W:2.015.

Notes: G, Gender; A, Age; E, Education; MDI, Monthly Disposable Income; USV, Utilitarian Shopping Value; HSV, Hedonic Shopping Value.

\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01.

Source:Own elaboration by the authors.

**Table 13**  
Impact of Perceived Usefulness, Perceived Ease of Use and Social Interactivity on User Stickiness.

Parameter Estimates (n = 183)										
Model		Unstandardized Coefficients		Standardized Coefficients	t	P	VIF	R <sup>2</sup>	Adj R <sup>2</sup>	F
		B	Std. Error	Beta						
Constant		0.613	0.470	–	1.305	0.194	–	0.371	0.346	F (7,175) =14.745, p = 0.000
Independent Variables	PEOU	0.269	0.075	0.263	3.603	0.000***	1.478			
	PU	0.223	0.086	0.189	2.589	0.010**	1.475			
	SI	0.250	0.049	0.343	5.140	0.000***	1.236			
	G	0.079	0.106	0.046	0.743	0.458	1.071			
Control Variables	A	0.007	0.054	0.009	0.123	0.903	1.358			
	E	0.072	0.144	0.030	0.502	0.616	1.006			
	MDI	0.005	0.048	0.007	0.110	0.913	1.233			

Dependent Variable: US

Notes: G, Gender; A, Age; E, Education; MDI, Monthly Disposable Income; PEOU, Perceived Ease of Use; PU, Perceived Usefulness; SI, Social Interactivity; US, User Stickiness.

\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01.

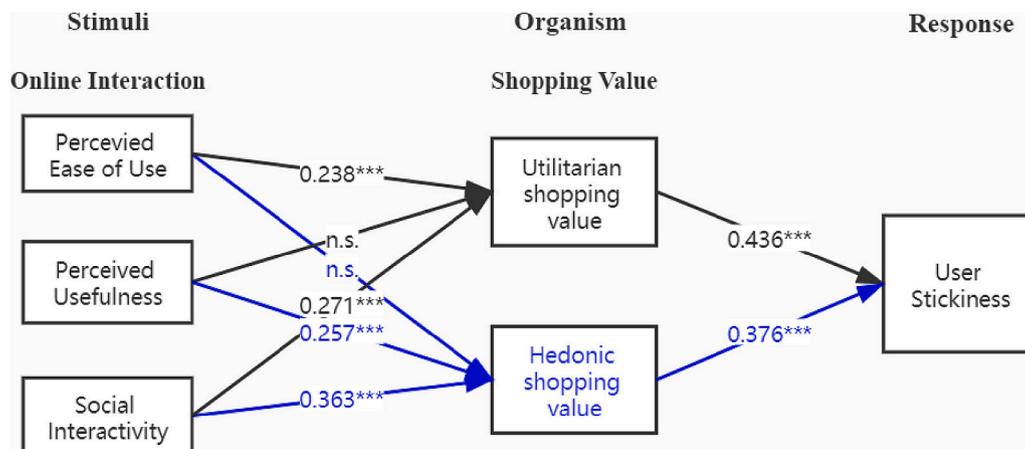
Source:Own elaboration by the authors.

4.6. Discussion of regression results

Concluded from the series of conducted tests, H1a, H3a, H2b, H3b, H4 and H5 cannot be rejected, while H2a and H1b are rejected. The consequences of the statistical results and hypothesis tests are summarized in Fig. 4 and Table 14.

First, as seen from the prior studies, different dimensions of online

interactions demonstrate significant differences on perceived shopping values. Perceived ease of use shows a positive relationship with the utilitarian shopping value, whereas perceived usefulness is positively correlated with the hedonic shopping value. These results are similar to the results reported in prior studies. For example, Cho and Sagynov (2015) clarify that perceived ease of use and perceived usefulness influence customers' willingness to change attitudes with respect to



**Fig. 4.** . The Results of Regression Analysis.  
Source:Own elaboration by the authors.

**Table 14**  
The Results of Hypotheses Tests.

Hypothesis	Content	Rejected or not rejected
H1a	Perceived ease of use has a significant positive impact on utilitarian shopping value.	Not rejected
H1b	Perceived ease of use has a significant positive impact on hedonic shopping value.	Rejected
H2a	Perceived usefulness has a significant positive impact on utilitarian shopping value.	Rejected
H2b	Perceived usefulness has a significant positive impact on hedonic shopping value.	Not rejected
H3a	Social interactivity has a significant positive impact on utilitarian shopping value.	Not rejected
H3b	Social interactivity has a significant positive impact on hedonic shopping value.	Not rejected
H4	Utilitarian shopping value has a significant positive impact on user stickiness.	Not rejected
H5	Hedonic shopping value has a significant positive impact on user stickiness.	Not rejected

Source: Own elaboration by the authors.

utilitarian and hedonic shopping values, which ultimately affects their intentions to make purchases on online platforms. It is worth noting that H1b and H2a are rejected. Similar results can be also found in other studies. For example, [Ozturk et al. \(2016\)](#) reported a non-significant relationship between perceived ease of use and the hedonic shopping value, which generates the same result as the rejection of H1b. Perceived usefulness does not show a significant effect on the utilitarian shopping value. One possible reason is that the platform design of social commerce paid a great effort in providing useful information through a function like customized recommendation. Therefore, the usefulness of a social platform becomes the hygiene factor that does not stimulate any increase in the customers' received utilitarian shopping value. In addition, social interactivity demonstrates a positive correlation with either the utilitarian shopping value or the hedonic shopping value. It is also worth noting that social interactivity generates the greatest effect on both shopping values, indicated by beta of 0.271 on the utilitarian shopping value and 0.363 on the hedonic shopping value, respectively. These findings manifest that shopping values are produced mainly through the interpersonal channel.

Second, both the utilitarian shopping value and the hedonic shopping value demonstrate the positive correlation with user stickiness. This result is consistent with previous studies. For example, [Chen and Lin \(2018\)](#) examined several factors including shopping values and concluded that they had a positive effect on website user stickiness. [Zhang, Guo, Hu, and Liu \(2017\)](#) reported that a positive relationship existed between the hedonic value and stickiness of Internet users. As the estimated beta of the utilitarian shopping value is 0.436, greater than the hedonic shopping value at 0.376, users still value more the function and helpfulness of social commerce platforms. The improvement in the hedonic shopping value should also be paid attention to as the gap between two betas is relatively small.

#### 4.7. Structural equation modelling

In this section we report the results obtained from the Structural Equation Model (SEM). The SEM is an alternative approach to the multiple linear regression modelling used previously. The SEM fits the first and second moments of the distribution of observed variables (i.e. means, variances, and covariances) rather than fitting the observed values themselves. We estimate the linear SEM model using the maximum likelihood method. The structure of the estimated SEM model is shown in [Fig. A1](#) in the Appendix. The estimation results are reported in [Table A1](#) in the Appendix.

The SEM estimation results support the positive and significant relationships between both the utilitarian and hedonic shopping values and user stickiness. This means that hypotheses H4 and H5 cannot be

rejected. However, this time the utilitarian and hedonic shopping values are positively and significantly related only to social interactivity while there are no significant relationships between the perceived ease of use and perceived usefulness and the utilitarian and hedonic shopping values. This means that hypotheses H3a and H3b cannot be rejected while hypotheses H1a, H1b, H2a and H2b can be rejected. However, it needs to be noted that the results of the SEM are not directly comparable with the results obtained from the multiple linear regression approach as the former does not allow controlling for some additional variables such as gender, age, monthly disposable income, and an education level that were controlled for in the latter approach.

## 5. Contributions and implications

### 5.1. Theoretical contribution and implications

This research delivers a high theoretical value by studying the influence of online interaction on user stickiness in a social commerce environment. This study is supposed to give possible strategy for social commerce in strengthening user stickiness in the area of online interaction. It clarifies the directions social commerce should head in the future in order to increase user stickiness.

Firstly, this study enriched the SOR model in the field of online interaction. The SOR model is widely applied when studying customer behavior, while factors about online interactions are not included in this model. By studying the influence of online interaction on user stickiness, this paper expanded the applicability of the SOR theory into the online interaction field. Therefore, this paper enriches the research content of the SOR model and expands the theoretical framework of the SOR model. Secondly, this study demonstrates the influence of online interaction on user stickiness through an empirical way, which helps to carry out further study about user stickiness strengthening. This also fills the gap of relevant studies in social commerce environment. Therefore, this paper contributes to the enrichment of theoretical achievements in the field of social commerce, and provides explanations to user stickiness as well. Ecommerce has now evolved into a furiously competitive industry where building and cultivating customer loyalty becomes the cornerstone to success. Therefore, user stickiness, a key factor to customer loyalty, contains a great study value. As an emerging mode of business, the online interaction function in social commerce still needs further development. Exploring the factors that affect the generation of user stickiness should become the focus of future research. Hence, this study helps building the theoretical foundation of social commerce and offering practical guidance to it.

### 5.2. Managerial contribution and implications

This study provides three managerial contributions and implications for businesses operating in the social commerce industry. The first one is to simplify and diversify platform functions to motivate computer-mediated interactions. The study reveals that both perceived ease of use and perceived usefulness have beneficial effects on customers' attitudes. Therefore, social commerce platforms need to simplify their platform architectures to achieve ease of use. For example, stable servers should be used to ensure that platforms can be opened conveniently and fluently. Besides, consistent and cohesive navigation systems should be constructed to increase users' access efficiency. By implementing such measures, more users can be activated, which deepens the access and enhances user stickiness. Moreover, contents shown on social commerce platforms should offer useful and diversified information during the purchase process. For example, personalized recommendation algorithms of social commerce platforms need to be improved. By tracking users' consumption habits, browsing history and preferences, more useful and accurate information can be provided to their users. These improvements could contribute to a better user experience and increase the shopping value users receive during their usage.

The second one is to modify platform contents to promote interpersonal interaction. The occurrence of interpersonal interaction motivates users' long-term interests toward the particular social commerce platform. In particular, incentive programs can be established to promote the information exchange between its users. Rewards like discounts or membership points are incentives for users to share their shopping information. Customers are more willing to help each other, thus interpersonal relationships are built into the social commerce platform. Moreover, diversifying forms of social interaction also help improving perceived shopping values. Various means of communication expansion users' channel to share their feelings. Current interaction channels mainly depend on text or pictures, which are difficult for users to deepen their communication. Therefore, more innovative technologies such as Virtual Reality (VR) can be applied in online interactions to enhance user shopping values.

The third one is to increase perceived shopping values to consolidate user stickiness. The empirical study demonstrates that perceived shopping value is a crucial factor that affects user stickiness. The improvements in the utilitarian shopping value and the hedonic shopping value should be the focus of social commerce. In particular, more computer technologies such as big data should be applied to strengthen personalized products and services. As users' needs for customized services get stronger, providing accurate personalized information influences users' utilitarian shopping value more than before. Therefore, upgrading the social commerce technology should have a beneficial effect on the utilitarian shopping value, and could further promote user stickiness. Moreover, operators should focus on building emotional bonds with users in order to increase the hedonic shopping value. During the design and operation of platforms, operators need to concentrate on catering to customer interests. For example, website designs should be customized according to users' preferences. Moreover, operators can run online activities that correspond to users' interests in order to establish emotional bonding with users.

## 6. Conclusions

This paper studied the effects of three online interaction factors, namely, perceived ease of use, perceived usefulness and social interactivity, as stimuli, on utilitarian shopping and hedonic shopping values.

## Appendix 1. Appendix

Furthermore, the importance of two shopping values for determining user stickiness was examined. The empirical results reveal that social interactivity produces the strongest impact among the three indicators. Moreover, social interactivity generates a significant and positive effect on both the hedonic shopping value and the utilitarian shopping value. Therefore, the interpersonal dimension is a direction that social commerce platform managers should pay more attention to. Furthermore, both the utilitarian shopping value and the hedonic shopping value generate significant and positive effects on user stickiness. As there is little difference between the significance of the utilitarian shopping value and the hedonic shopping value, social commerce platform managers should balance their effects in this regard to maximize user stickiness.

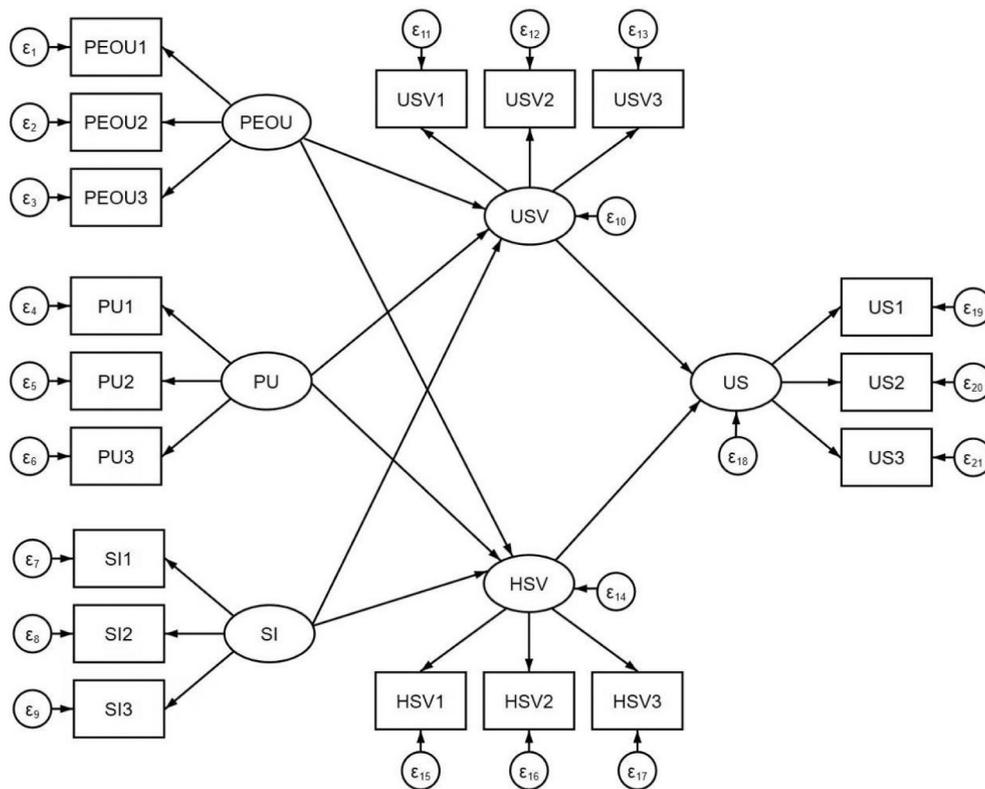
This study has some limitations related to the classification of online interactions and the sample collection. First, although the two-dimensional classification used in this study is one of the most frequently used methods to evaluate online interactions, there are also other types of classification. Depending on the diversity of business models and focuses, the forms of online interactions may vary in different backgrounds. Therefore, the further robustness tests of our results could be done in future studies in more detailed states considering the forms of social commerce. Second, in the questionnaire, questions to each variable are subjective multiple choices. Answers to these questions might be affected by the environment, time or other external factors. These problems should be considered in future studies in order to enhance the validity and reliability of our results. Finally, more individual traits such as personal characteristics could be included as moderation variables to make the empirical model more complete.

## 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.

## Data availability

Data will be made available on request.



**Fig. A1.** Graphical representation of the SEM model. Source:Own elaboration by the authors.

**Table A1**  
SEM estimation results.

	Coefficient	Standard error	z-value	p-value
USV				
PEOU	0.302	0.228	1.33	0.185
PU	0.118	0.261	0.45	0.650
SI	0.316***	0.065	4.84	0.000
HSV				
PEOU	-0.168	0.294	0.57	0.568
PU	0.439	0.366	1.20	0.230
SI	0.398***	0.077	5.12	0.000
US				
USV	0.696***	0.155	4.47	0.000
HSV	0.404***	0.125	3.22	0.000

Notes: PEOU, Perceived Ease of Use; PU, Perceived Usefulness; SI, Social Interactivity; US, User Stickiness.

\*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Source:Own elaboration by the authors.

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