



How behaviors on social network sites and online social capital influence social commerce intentions

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Abstract

Following the fast growth of social network sites (SNSs) such as Twitter, LinkedIn, and Facebook in the cyber world, social commerce has become an important emerging issue in these SNS. The study aims to comprehend the antecedents for SNS users' social commerce intentions (SCI). This study applied SNS behavior and social capital theory to investigate how these factors influence SCI. Each of the three constructs was further decomposed into two first-order constructs, participating and browsing for SNS behavior, bonding and bridging social capital for social capital, and giving and receiving for SCI. The results, which were based on 970 effective samples of Facebook users, supported several findings. Both SNS behavior and social capital affect SCI, while the relationship between SNS behavior and SCI is partially mediated by the bonding and bridging social capital. In addition, browsing and participating behaviors have significantly positive relationships with bonding and bridging social capitals, respectively. All of the relationships between first-order constructs tested significant, with the single exception that browsing of SNS behavior did not lead to the giving of SCI. This study also applied post hoc analysis for better understanding SCI on SNSs. The results showed that browsing of SNS behavior has a stronger impact than participating of SNS behavior on either bonding or bridging social capital. In addition, bridging social capital has a stronger influence than bonding social capital on the giving intention of social commerce. Theoretical contributions and managerial implications are also discussed to provide several future research directions and suggestions for scholars and SNS operators, respectively.

Keywords

SNS behavior; Social capital theory; Social commerce

1. Introduction

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Social network sites (SNSs) have emerged in the virtual world in recent years, and consequently, the number of SNS members has increased. SNSs have adopted the Internet as a platform that enables online users to connect with each other through the creation of personal information and profiles, to invite friends and colleagues to access files, and to send e-mails and instant messages between friends [1]. Such personal information and profiles can include various types of information, including photos, videos, audio files, and public bulletin boards (blogs) [2]. Through the interpersonal social activities that are based on applications, SNS members can conduct their social lives and accumulate social capital [3]. Therefore, SNSs have become increasingly popular and an essential part of the daily life of individuals in recent years.

Social interaction is an important issue on SNSs [3]. The users of Facebook (FB), a well-known SNS, identify their users' online friends usually by searching their offline friends rather than browsing the web to find new friends [4]. Hence, the relationship among known friends is very important on SNS [5]. Interacting with friends can accumulate social capital, which has been defined as "the resources that are available to people through their social interactions with others" [6]. The ability to form and maintain relationships is a necessary precondition for the accumulation of social capital [7]. A study extended this notion by emphasizing the importance of developing a social network, considering social capital to arise from investments in social relations with expected returns [8]. Therefore, social capital is an essential element for users' behavior on SNSs [4,8].

Social commerce, a subset of e-commerce, adopts Web 2.0 technologies and infrastructure to assist online interpersonal interactions and contributions for acquiring and exchanging shopping experiences [9]. It is burgeoning tremendously because of the growth of users on SNS [[10], [11], [12]]. The revenues generated by social commerce grew to approximately US\$30 billion worldwide in 2015 [12]. According to a study [13], some elaborations regarding social commerce exist in the developing processes of SNSs. While users of FB regularly click the "like" or "share" function on their friends' accounts, another function, represented as a "buy" button, is developing to give users the ability to purchase products as they browse SNSs. Evidently, FB has tried to apply the concept of social commerce to encourage online transactions for small- and medium-sized businesses with limited use for their operations in the US [14].

Indications have shown the rapid development of SNSs concerning more commercial applications that are still in their initial developing stage, which may become an important topic of research as well as a practical issue shortly. Based on a literature review, this study adopted SNS behaviors (participating and browsing) [[15], [16], [17]] and social capital (bonding and bridging) [18] to evaluate social commerce intention (SCI) [9,19]. The purposes of the research are as follows: First, to comprehend how SNS behaviors and online social capital (bonding and bridging) influence SCI. Second, to investigate whether the influence of SNS behavior on SCI is mediated by social capital. Third, by further dividing each of the constructs into two parts, browsing and participating for SNS behavior, bonding and bridging for social capital, and receiving and giving for SCI, this study intends to investigate the relationships among the three constructs in detail.

2. Theoretical background and hypotheses

2.1. Social commerce

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The term “social commerce” was first introduced in 2005 on Yahoo, when it introduced Yahoo!’s Shophosphere, the earliest such service for social commerce. The “Pick Lists” feature allows users to comment on and review products lists [20]. Before 2005, Amazon.com and eBay.com introduced some social commerce-related functions and features in their websites, i.e., Listmania for reader rating systems by Amazon.com and a feedback forum on the products’ browsing pages by eBay.com as early as the late 1990s. As social commerce utilizes SNSs as a platform to combine both shopping and social networking activities, electronic word of mouth (eWOM) can be an essential element of social commerce. Scholars have defined social commerce as having taken eWOM where it never existed before in online shopping [21]. Online users are now seeking ways to learn from each others’ expertises and experiences to get more information to make effective purchasing decisions. It is commonly observed that SNS users rely on eWOM when they search for shopping information [22]. Generally, social commerce is WOM utilized in e-commerce on social media, especially SNSs.

With regard to the definition of social commerce, this study summarized previous studies and proposed that social commerce is to utilize Web 2.0 technology such as social media to support the social interaction of receiving or giving shopping information, including experience, eWOM, and user-generated content [19,23]. By adopting the IBM definition [24], [21] also stated that social commerce is the concept of WOM applied to e-commerce. To measure the intention of WOM, [25] proposed that the giving of WOM and the acceptance of WOM by another individual are both important if WOM is to be effective [26]. eWOM can also be divided into three types of behavior, i.e., giving, passing, and obtaining information [27]. Similarly, giving and receiving were considered as the two sub-constructs of social commerce [19], in which giving is equivalent to giving and passing information for eWOM and receiving is equivalent to obtaining information for eWOM.

In an earlier study, SCI was measured in one construct [19]. However, the authors indicated that no previous measurement existed, and they had to develop a measurement for SCI. They wrote “*we designed items to assess a user’s intention to recommend shopping information and products and the intention to receive shopping information and products on social networking sites.*” In this statement, they clearly had two categories for SCI, giving shopping information and receiving shopping information. Hence, this study divided the SCI into two forms, receiving and giving, to have a better understanding regarding users’ behavior in SNS. To facilitate the research, this study applied SCI as a surrogate of actual behavior for two reasons. First, it is difficult to collect actual behavior. Second, intention was proven to be a valid predictor of actual behavior and verified by several well-known theories such as the theory of reasoned action [28], the theory of planned behavior [29], and the technology acceptance model [30,31].

2.2. Social capital

The concept of social capital has become increasingly popular in social science disciplines [32]. It has been applied to interpret a wide range of social phenomena. Nahapiet and Ghoshal [33] and other researchers have considered the role of social capital to have an impact on the development of human capital [7,34,35]; on the economic performance of firms [36], geographic regions [37,38], and nations [39,40]; and on economic development [41]. Social capital has been widely applied not



Moreover, social capital has been defined as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or a social unit” [33]. It may be regarded as a pool of resources that should be tapped through the social ties, which allow access to and use of resources embedded in a social network [42].

The notion of social capital has been applied to multiple social science settings [32]. Because of its ambiguity and multidimensionality, a variety of different operationalizations and variables have contributed to the representations of social capital [7,43]. Various forms of social capital were developed involving ties with neighbors and friends that are related to indices of psychological well-being, such as self-esteem and life satisfaction [44,45]. Social capital can be measured by the amount of trust and reciprocity found in a community or between individuals [18] and is characterized by two forms, bonding and bridging. Bonding social capital is more exclusive and reinforces identities and homogeneous groups and is characterized as strong ties [18]. Therefore, bonding social capital has little diversity in its background but strong personal connections. The bonding social capital between individuals in tightly knit, emotionally close relationships for high recognition and mutual goals, such as family, close friends, or even neighbors, is referred to as strong ties [46,47]. Such ties can be costly to maintain, requiring much time and attention. Strong ties are featured by frequent contact and multiple foci and are found in dense networks [48]. These strong ties provide emotional or substantive support rather than informational quality for each member of the network and also refer to resources obtained from within-group ties [49].

In addition to bonding social capital, bridging social capital is linked to what network researchers refer to as weak ties, which are loose or fragile connections between individuals who may provide useful or novel information, or new perspectives for each other, and is typically not emotional support formed by mutual benefits [47]. Bridging social capital occurs when individuals from different backgrounds make connections between social networks [50]. It can also be viewed as the broadening of one’s social horizons or worldviews because what it lacks in depth, it makes up for in breadth. Bridging social capital, or weak ties, can be less costly to maintain, and a person who has many weak, heterogeneous ties has access to a wide range of information and opportunities [51,52]. However, it provides little in the way of emotional support [18]. Researchers have applied social capital theory to evaluate knowledge contribution [53] or to measure the quantity of knowledge sharing [54]. When contributing or sharing knowledge regarding products or services, knowledge contribution or sharing represents the same behavior as that of social capital.

2.3. SNS behavior

SNSs provide social interaction and networking features of information exchange, message posting, and contact management. Previous literature related to SNSs classified the forms of users’ behavior into interactive and noninteractive [55], and categorized the types of SNS members into communicative and quiet [56]. Communicative members represent those who behave actively by interacting with other members on SNS. Those behaviors of interest include posting contents such as comments on other users’ posts, questions related to the host company’s services or community topics in general, and product reviews and experiences. Quiet members usually refer

to users who just read other

behaviors are regarded as browsing [56]. Other studies also discuss SNS-related behaviors [15,17]. Therefore, this study defines SNS behavior as participating and browsing, equivalent to communicative and quiet, or interactive and noninteractive, respectively, for further analysis.

Most of the users visit SNSs to outreach and/or interact with other members [57]. These relationships among users and within their communities are the source of social capital [58]. Scholars have examined the relationships between FB usage and the formation of social capital among university students [3]. The intensity of FB usage plays an important role in the creation of social capital [59].

In addition to social capital, SNS behavior can also influence SCI. According to the social exchange theory, human relationships are formed by comparing the alternatives and using a subjective cost-benefit analysis [60]. When the costs exceed the rewards, people will terminate or abandon that social relationship. The costs, involving cognitions or perceptions, are seen as negatives to the individual and are equivalent to putting money, time, and effort into an interpersonal relationship [61,62]. The benefits are the results and effects the individuals acquire from relationships, such as friendship, emotions, companionship, and social support. The theory proposes that individuals essentially take the benefits and subtract the costs to determine the worth of a relationship. Positive relationships are those in which the benefits exceed the costs, while negative relationships occur when the costs are greater than the benefits [63]. Therefore, the theory suggests that individuals employ a cost-and-benefit analysis to evaluate their social relationships and engage in social exchange only when the benefits outweigh the costs [60,64].

When users engage in SNSs, the benefit will be either accessing useful shopping information as the receiver of SCI or the giver of SCI gaining social rewards such as status approval or respect. In addition, users are exposed to marketing-related information when visiting SNSs [22]. As a result, they will be motivated to forward this information to others for altruistic purposes or for enhancing their self-worth [65]. In a company-hosted FB community, the participation of this community may be an indicator of the loyalty toward the company, which is perceived as an antecedent of referring intention [66].

As social commerce involves transferring product information (i.e., receiving and giving), it seems reasonable to assume that SCI increases when users are highly attached to SNS. In a study regarding the purchase decision process, SNS involvement has a positive effect on purchase intention, mediated by eWOM [67]. The results showed that users are more likely to share or search for shopping information when they spend more time on SNS either browsing or participating.

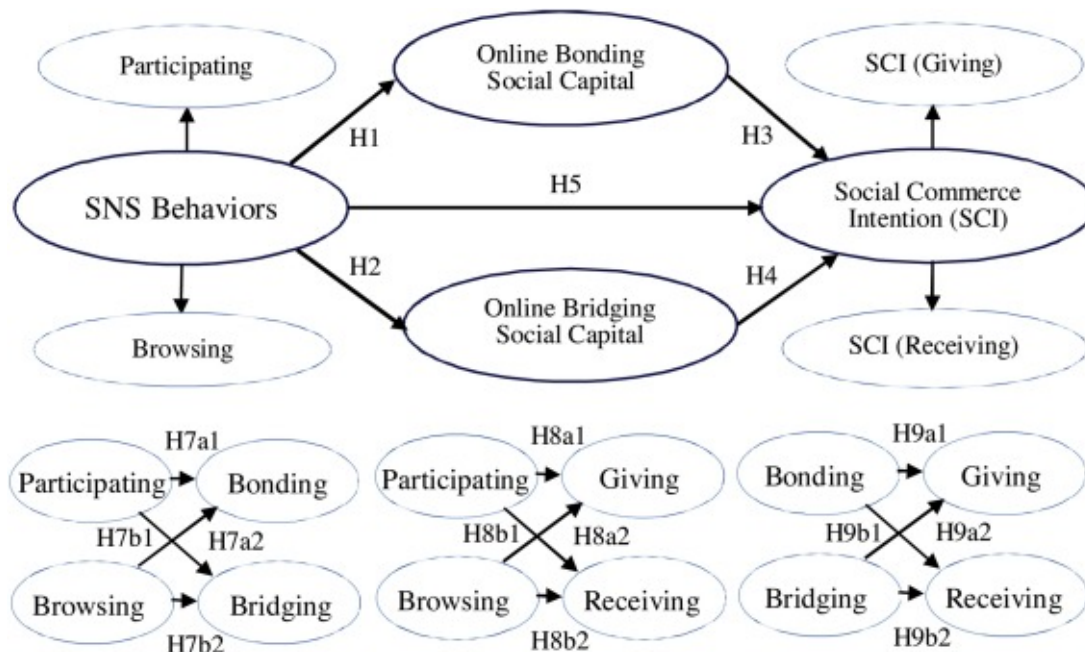
Previous studies involve adopting Web 2.0 social media technologies and infrastructures to support online interpersonal interactions and online users' contributions to assist in acquiring shopping information [19,68,69]. That is, SNS behavior may directly influence SCI, including giving and receiving behaviors as discussed earlier in the study. SNS behavior can also be utilized to estimate referral intention that can be regarded as giving SCI [17]. SNS supports social interaction and user contribution that can assist in acquiring information about products and services [19]. Moreover, various forms of social interaction, such as online consumers' numerical ratings of products and services, the number of online reviews, and online users' opinions, are



3. Methodology

3.1. Research framework

The research framework is shown in Fig. 1. SNS behavior and social capital are correlated with SCI. In general, the social capital theory explains the mediating roles of bonding and bridging social capital between SNS behavior and SCI, and the social exchange theory supports the direct relationship between SNS behaviors and SCI. Social capital has been divided into bonding and bridging social capital in various SNS studies [8,22,[70], [71], [72]], and this study also elaborates social capital as a second-order construct, including two first-order constructs: bonding and bridging social capital. SNS behavior is hypothesized as an antecedent of bonding and bridging social capital. SNS behavior and SCI are further divided into participating and browsing, and giving and receiving, respectively. The upper part of the figure represents the main effects of the second-order constructs for SNS behavior and SCI, where the lower part of the figure indicates the relationships, similar to the main effects, among the first order of the three constructs.



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Fig. 1. Research Framework.

This study adopts SNS behavior and SCI as second-order constructs to follow the guidelines for parsimonious models or hierarchical component models [73]. First, the number of relationships reduced in the structural model makes the path model more parsimonious and easier to be understood. Second, if the constructs are highly correlated, the estimated relationship in the structure model may be biased as a result of collinearity issues, and discriminant validity may not

be established. In this situation,

discriminant validity problems. Consequently, the study split up the set of indicators and established separate constructs in a higher order structure.

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3.2. Hypothesis development

Users' behavior on FB showed positive associations between SNS usage and social capital [74]. The intensity of SNS usage was significantly related to personal satisfaction, greater trust, and involvement in political and civic activities. FB enables online users to engage in online interactions that contribute to their social capital. In addition, FB helps users establish and maintain deeper and more meaningful communications with a selected group, usually their close friends, to build strong ties as bonding social capital [72]. More frequent FB visits can lead to higher bonding social capital [75]. Close friends who connect through FB as online social capital are likely to find an efficient and easy way to keep in touch and the lightweight interactions enabled by the site are likely to benefit these more developed relationships as well [70]. Therefore, this study proposes

H1

SNS behavior is positively associated with individuals' online bonding social capital.

The intensity of SNS behavior is positively associated with bridging social capital because SNSs can lower barriers between users [3]. Therefore, SNSs may encourage the formation of bridging social capital [8]. Moreover, SNSs also break down distance and time limits enabling SNS users to interact with other users (family members, friends, or acquaintances) by its function of instant update information. A study adopted the FB habit defined as a part of participants' regular Internet routine, and the results indicated that FB user behavior positively predicted online bridging social capital [72]. The extent to which FB was habitual for users was associated with an increase in online bridging social capital. Therefore, this leads to the following hypothesis:

H2

SNS behavior is positively associated with individuals' online bridging social capital.

Strong ties (bonding social capital) are imperative for transferring sophisticated knowledge across department boundaries in an organization [76] and also facilitate the transfer of tacit knowledge. Social commerce utilizes Web 2.0 social media technologies and infrastructures to support online interpersonal interactions and online user contributions to assist in acquiring or giving product information that may include complex products such as 3C (computer, communication, and consumer electronics) or general information about daily used products [19]. Hence, this study proposes the following:

H3

Online bonding social capital is positively associated with SCI.

According to the weak-tie theory [52], distant and infrequent relationships are effective for knowledge sharing because those friendships provide access to novel information by bridging otherwise disconnected groups and individuals in an organization [53]. Furthermore, it is easier for weak ties to link an information seeker with sources in disparate parts of a social network such

that information seekers may

social network [77]. Hence, the study hypothesizes



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H4

Online bridging social capital is positively associated with SCI

Prior studies define social commerce as adopting Web 2.0 social media technologies and infrastructures to support online interpersonal interactions and online users' contributions to assist in acquiring shopping information [19,68,69]. Social media serves as a platform to expedite online transactions in which product information exchange may increase product purchases and sales. In addition, the social exchange theory [60] predicts that SNS users will conduct social commerce behavior to receive their benefit, browse useful product information, or post product information in exchange for social reward or self-worth [65], exceeding the costs of browsing and participating. Hence, the intensity of usage in social media such as SNSs is positively associated with SCI. Accordingly, this study postulates

H5

SNS behavior is positively associated with SCI

The mediator testing in this study follows the suggestions [78] that online bonding social capital is the mediator between SNS behavior and SCI when both H1 and H3 test significantly [79,80]. Similarly, supporting the results for both H2 and H4 will provide evidence that online bridging social capital is the mediator between SNS behavior and SCI. Hence, this study proposes the following hypotheses:

H6

Online social capital is the mediator between SNS behavior and SCI.

H6a

Online bonding social capital is the mediator between SNS behavior and SCI.

H6b

Online bridging social capital is the mediator between SNS behavior and SCI.

An examination of the relations between FB usage and social capital among college students showed that using FB for reasons of sociability was related to increased online bonding and bridging Social capital [72]. Usage of FB was defined as the number of hours per day the participants use FB, and the behavior on FB usually includes both participating and browsing [17]. Participating requires a higher level of interactions with others [81] and is expected to have a direct impact on the accumulation of social capital. Participating in SNSs also promotes bridging social capital or weak ties by expanding the scope of connections that can be made with other SNS users [3,8,70,82,83]. Moreover, communication on FB was associated with increases in tie strength [84]. Hence, the study suggests the following:

H7a1

Participating behavior is positively associated with online bonding social capital.



Participating behavior is positively associated with online bridging social capital.

The information commonly included on SNS users' profiles is likely to be relevant to existing acquaintances or friends, and nearly all users felt that their SNS friends had viewed their profiles [3]. FB users can browse the profiles of those in their FB "network" (potentially thousands of individuals) whose privacy settings permit access and try to make friends with other SNS users. Users are able to control how much of their personal information and behavior is to be revealed by using different privacy settings on FB [85,86]. Hence, browsing behavior is a form of interactive behavior among SNS users who thereby accumulate social capital.

In addition, FB provides the function, "News Feed," which notifies users of their friends' latest behaviors such as posting news, photos, or a profile change in real time [87]. Browsing friends' instantly updated information, defined as passive or latent interactions, often dominates users' behavior on FB [88,89]. A study of a popular SNS in China, Renren, showed that visits to other users' profiles generate more active latent interactions (comments) than visits to photos or diary pages [88]. Browsing other users' profiles can construct latent interaction as a more accurate representation of meaningful peer interactions. Silent interactions such as browsing pages of other users, including close and regular friends, increase the level of interaction among users [89]. The social interaction between members may generate both bonding and bridging social capital [3]. Hence, this study proposes

H7a2

Browsing behavior is positively associated with online bonding social capital.

H7b2

Browsing behavior is positively associated with online bridging social capital.

Participating behaviors in online travel communities have a positive effect on consumers' intention to utilize relevant products [15]. Moreover, despite their highly diversified backgrounds, online users are capable of sharing their personal experiences on certain topics on SNSs, and these behaviors can steer their interactions toward other users with similar interests [90]. Sharing topics of products or services may be considered as the giving and receiving of SCI. In addition, frequent participation increases awareness of SNS users that may broaden their shopping information sources [91]. The ease of accessing services provided by SNSs fosters customers to maintain interest in products or services, invoking motivation to visit SNSs [92]. Users participating or browsing on SNSs are exposed to marketing-related information, and they are expected to forward this information to those who are motivated by altruistic purposes or self-worth [60].

Building relationships with other online users having common interests create a comfortable atmosphere that encourages them to share information. Participation in SNS implies in-depth knowledge or information exchange, which consists of receiving and giving information. SNSs allow, in principle, the integration of other social media applications, such as wikis or blogs, and permit collaboration and knowledge exchange for learning spaces [93]. Lastly, based on the social exchange theory [59], users engaging in SNS behavior are motivated to adopt beneficial activities

such as viewing useful produ

reward or respect on SNS. Therefore, we predict the following hypotheses.

H8a1

Participating behavior is positively associated with SCI (Giving).

H8b1

Participating behavior is positively associated with SCI (Receiving).

With regard to browsing behavior, FB users may browse the news feed of SNS to notify other users of information such as sharing photos or check-in places and then press “like” and “share.” These sharing contents could be intriguing to those who are motivated to help others and enhance their self-worth in terms of their eWOM behavior [94]. Furthermore, visiting an SNS for browsing purposes also enhances users’ eWOM behavior, such as referring shopping information [95]. From the perspective of cost–benefit analysis, browsing users will have the same motivations as participating users to conduct social commerce behavior. Hence, browsing behavior may motivate SNS users to give and receive shopping information. Consequently, this study proposes the following hypotheses:

H8a2

Browsing behavior is positively associated with SCI (Giving).

H8b2

Browsing behavior is positively associated with SCI (Receiving).

Social capital is a valuable resource for instilling trust and reciprocity, both of which are developed in the iterative process [96] and offer one referral by these acquaintances and close friends [32]. Bonding social capital creates a strong tie that provides emotional and substantive support within a homogenous group on a private network [22,46,47]. Hence, bonding social capital is an important factor for referral among close friends because strong ties can activate the flow of referral behavior efficiently [5]. In general, strong ties exert a more significant impact at the individual level [22].

Perceived social tie strength (strong tie and weak tie) is positively associated with consumers’ intention to seek product-focused information in online social media and is not significantly related to consumers’ intention to give information through SNSs [22]. Two reasons explain the results. First, when giving information through SMSs, consumers tend to share their product experience with all their contacts, which adds up to a great number of acquaintances (i.e., weak ties), instead of only their close friends (i.e., strong ties). Second, SNSs allow users to provide information easily and quickly without thinking carefully. However, investigations show that close friends and relatives now account for a higher percentage of an individual’s contacts list on FB. It also means users currently have more close friends on SNSs [97], and close friends are more willing to give or receive information through SNSs [98]. Therefore, the study hypothesized that a strong tie (bonding social capital) would also influence online users’ intention to provide product information through SNSs.

H9a1

**H9b1**

Online bonding social capital is positively associated with SCI (Receiving).

Bridging social capital provides information support and has many weak heterogeneous ties to access a broad range of information [51,99,100]. Therefore, weak ties demonstrated a crucial bridging function, allowing referral information to disseminate and spread among distinct groups such as information flows within dyads or small groups [22]. As mentioned previously, bridging social capital represents information to support and is an important influential factor for SNS users to give and receive information [5].

An investigation for the members of electronic communities of practice conceptualized the social reasons for participation within the context of social capital generation [33]. The member's professional reputation is a significant influential motivator for contribution and participation.

Tie strength may increase with one-on-one communication in the form of posts, comments, and messages, and through reading friends' broadcasted content such as status updates and photos. The effect is greater for composed pieces such as comments, posts, and messages [84]. Therefore, SNS users tend to contribute their knowledge to raise their reputations among online users to increase bridging social capital on SNSs. Other SNS members would also be willing to receive information from professional leaders' opinions on SNSs while trust and reciprocity are developed in an iterative process to form social capital [96]. Moreover, as mentioned previously, SNSs allow users to provide information easily and quickly to either close or ordinary friends through SNSs [22]. Therefore, this study proposes:

H9a2

Online bridging social capital is positively associated with SCI (Giving).

H9b2

Online bridging social capital is positively associated with SCI (Receiving).

4. Results and analysis

4.1. Data collection

This study chose the users of FB as samples to test the research model because FB is the most popular SNSs for providing research samples under scrutiny [74]. Because the questions from the literature review are presented in English, and the samples in this study do not use English as the official language, this study translated them from English into Chinese. To ensure the measurement of items with precise interpretation from English, this study proceeded with a backward translation of questionnaire items by four professionals with sufficient English proficiency. They translated those items forward (English to Chinese) and backward (Chinese to English) several times until the meanings of the measurements of items became consistent.

A seven-point Likert scale wa

respectively. College students provided samples for the pre-test, and seven items with low loadings were deleted. Questionnaires were then distributed both online- and as paper-based surveys. Information on recruiting respondents for the questionnaire was announced on Taiwan's largest Bulletin Board System (PTT) to recruit FB users. The data collection process took approximately one month to collect data from the paper- and online-based surveys concurrently from 2014/10/15 to 2014/11/15. A total of 1020 samples were collected, of which 492 and 528 samples were from online- and paper-based surveys, respectively. Because of incomplete data, 21 online-based samples and 29 paper-based samples were deemed invalid resulting in an effective sample collection rate of 95.1%. The online- and paper-based surveys had total 471 (48.6%) and 499 (51.4%) samples, respectively. A total of 970 samples were used for further analysis.

The demographical information of respondents is shown in [Table 1](#). Male samples account for 367, or 37.84%, whereas female samples total 603, representing 62.16%, suggesting that female users are more interested in visiting SNSs than male users [94], and a higher percentage of female samples has been commonly observed in several SNS studies [3,5,19,70,101]. In addition, respondents at the age of 20–30 years are the major survey group, and the portion of total respondents aged under 30 is similar to another study that FB users with ages between 18 and 30 years accounted for 88% among all users [102]. The majority of the sample have SNS experience of more than three years, hold undergraduate degrees or above, and are students.

Table 1. Demographic information of respondents.

	Category	Count	Percentage
Gender	Male	367	37.84%
	Female	603	62.16%
SNS Using Experiences (in years)	1–3	14	1.44%
	3–5	579	59.69%
	>5	377	38.87%
Age	<20 (18-19)	150	15.46%
	20–30	695	71.65%
	31–40	51	5.26%
Education	41–50	58	5.98%
	>50	16	1.65%
	Junior College	11	1.13%
	College	747	77.01%
	Graduate	197	20.31%

	Download	Share	Export	
Occupation	Other		15	1.55%
	Student		762	78.56%
	Public sector		7	0.72%
	Private sector		144	14.85%
	Professional		41	4.23%
	Other		16	1.65%

The numbers of online- and paper-based surveys are 492 and 528, respectively. The results of testing the differences between these two sources on their five demographical and behavioral characteristics show that SNS experience is insignificant; gender is significant only at 0.1 and can be disregarded; occupation is significant at 0.05; and age and education level are significant at 0.01. In general, online-based respondents are younger, have education levels slightly lower than paper-based respondents do, and are scattered more evenly across different occupations. To examine whether these two types of samples might affect the research model, SEM was used to test the research model as shown in Fig. 1. The results of the model specifications from online respondents show AVE, CR, and R² in the ranges of 0.59–0.82, 0.88–0.93, and 0.26–0.85, respectively. The results of paper-based respondents are 0.60–0.81, 0.89–0.93, and 0.27–0.79 for AVE, CR, and R², respectively. These two types of respondents display no significant difference. Moreover, the study applied multigroup analysis [103] to test the differences between paper-based and online-based respondents for casual relationships. The results also indicate no significant difference between all of the relationships tested. Therefore, the study concluded that combining the respondents from the two sources for further study is appropriate.

4.2. Reliability and validity

Table 2 presents the results of factor analysis for cross-loadings after removing several items due to low loadings. Each item within the expected constructs has the loading larger than the value of 0.7, and no significant cross-loadings among constructs are observed [104].

Table 2. Item cross-loadings.

	SNS Behavior- Participating	SNS Behavior- Browsing	Bonding Social Capital	Bridging Social Capital	SCI-Giving	SCI-Receiving
Par1	0.73	0.33	0.34	0.36	0.32	0.31
Par2	0.89	0.37	0.31	0.33	0.39	0.32
Par3	0.76	0.37	0.32	0.34	0.46	0.36
Par4	0.88	0.37	0.30	0.34	0.36	0.30

	SNS Behavior- Participating	SNS Browsing	Download Social Capital	Share Social Capital	Export	
Par5	0.83	0.42	0.30	0.40	0.36	0.34
Bro1	0.41	0.70	0.33	0.50	0.29	0.35
Bro2	0.30	0.79	0.38	0.47	0.31	0.35
Bro3	0.37	0.85	0.35	0.46	0.31	0.36
Bro4	0.39	0.83	0.37	0.47	0.33	0.38
Bro5	0.33	0.83	0.36	0.48	0.31	0.37
Bro6	0.36	0.74	0.38	0.47	0.29	0.35
Bon1	0.34	0.43	0.76	0.49	0.34	0.41
Bon2	0.32	0.41	0.77	0.49	0.28	0.41
Bon4	0.29	0.39	0.76	0.50	0.30	0.39
Bon6	0.23	0.26	0.76	0.36	0.29	0.35
Bon7	0.31	0.32	0.74	0.42	0.32	0.36
Bri1	0.24	0.40	0.42	0.76	0.35	0.36
Bri2	0.30	0.52	0.47	0.81	0.40	0.41
Bri3	0.32	0.50	0.46	0.83	0.43	0.44
Bri4	0.31	0.47	0.46	0.83	0.40	0.42
Bri5	0.40	0.42	0.41	0.73	0.39	0.42
Bri6	0.33	0.49	0.41	0.76	0.38	0.39
Bri7	0.27	0.39	0.38	0.71	0.30	0.33
Bri8	0.42	0.50	0.51	0.72	0.36	0.43
Giv1	0.34	0.36	0.43	0.50	0.86	0.54
Giv2	0.45	0.34	0.36	0.44	0.93	0.52
Giv3	0.45	0.34	0.32	0.39	0.90	0.57
Rec1	0.32	0.43	0.44	0.49	0.55	0.89
Rec2	0.38	0.40	0.49	0.46	0.51	0.88
Rec3	0.35	0.38	0.40	0.43	0.55	0.89

The construct measurements, including questions, loadings, and sources, are shown in [Table 3](#). They all have standardized loadings ranging from 0.71 to 0.93. A higher value represents a stronger relationship between the item and its corresponding construct, and a value larger than 0.7 is considered acceptable [105]. To ensure the generalization of samples, a two-sample *t*-test was

conducted to test the differer

Items Bro6, Bon4, Bri7, and Giv2 are significant between paper and online-based surveys at 0.05 level. These items are scattered at different constructs, and an initial test for the hypotheses shows no significant differences between the model using all of the items and the model excluding the significant items. Therefore, we include all of the items for further analysis.

Table 3. Measurement items.

Constructs	Item	Questions	Loadings	Source
Participating	Par1	I participate actively in FB activities.	0.72***	
	Par2	I regularly contribute to FB.	0.89***	
	Par3	I usually provide useful information to other FB members.	0.76***	[15]
	Par4	I post messages and responses on FB frequently.	0.88***	
	Par5	I post messages and responses on FB with great excitement.	0.83***	
Browsing	Bro1	I like to browse FB to see what friends share through the real-time newsfeed.	0.71***	
	Bro2	I like to browse FB to see what's new (either directly on the community page or through newsfeed).	0.79***	
	Bro3	I like to browse FB for new ideas and thoughts.	0.85***	[106]
	Bro4	I like to browse FB to help me generate new ideas and thoughts.	0.83***	
	Bro5	I like to browse FB to absorb new knowledge.	0.83***	
	Bro6	I browse the contents of FB frequently.	0.74***	
Online Bonding Social Capital	Bon1	There are several SNS friends I trust to help me solve my problems.	0.82***	
	Bon2	There is someone on FB I can turn to for advice about making very important decisions.	0.83***	
	Bon4	When I feel lonely, there are several FB friends I can talk to.	0.79***	[50]
	Bon6	The people I interact with on FB would put their reputation on the line for me.	0.72***	
Online Bridging Social Capital	Bon7	The people I interact with on FB would be good job references for me.	0.73***	
	Bri1	Interacting with FB friends makes me interested in things that happen outside of my town.	0.79***	[50]
	Bri2	Interacting with FB friends makes me want to try new things.	0.83***	

Constructs	Item	Quest		Download	Share	Export	
	Bri3	Interacting with FB friends makes me interested in what people unlike me are thinking.					0.85***
	Bri4	Talking with FB friends makes me curious about other places in the world.					0.85***
	Bri5	Interacting with FB friends makes me feel like part of a larger community.					0.74***
	Bri6	Interacting with FB friends makes me feel connected to the bigger picture.					0.78***
	Bri7	Interacting with FB friends reminds me that everyone in the world is connected.					0.72***
	Bri8	I am willing to spend time to support general FB activities.					0.71***
	Giv1	I am willing to share my experiences and offer suggestions when my friends on FB want my advice on buying something.					0.86***
SCI (giving)	Giv2	I am willing to share my own shopping experiences with my friends on FB.					0.93*** [19]
	Giv3	I am willing to recommend a product that is worth buying to my friends on FB.					0.90***
	Rec1	I consider the shopping experiences of my friends on FB when I want to shop.					0.89***
SCI (receiving)	Rec2	I ask my friends on FB to provide me with their suggestions before I go shopping.					0.88*** [19]
	Rec3	I am willing to buy products recommended by my friends on FB.					0.89***

Note: ***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.1$.

Partial least squares (PLS) is a multivariate data analysis technique based on a linear relationship between the specifications of the entire research structure [107]. This study used PLS to test the causal effects of the research model and applied SmartPLS 2.0 to analyze the model. To affirm the causal relationship in the research model, this study first tests the relationships among SNS behavior, social capital, and SCI as three single constructs. The relationships between SNS behavior and social capital are significant, with a coefficient of 0.64 and a t-value of 31.81. The relationship between social capital and SCI is also significant, with a coefficient of 0.61 and a t-value of 25.45. R^2 for social capital and SCI is 0.41 and 0.37, respectively, representing a significant level of 0.01. With the causal relationships of the second-order constructs all significantly positive, this study proceeds to test the research model.

Social capital plays an important role in the studies of SNS behavior and social commerce, and this study is the first research hypothesizing the mediating role of social capital between SNS behavior and social commerce. Therefore, social capital is divided into bonding and bridging social capital

to further investigate their in

order constructs, the relationships among all first-order constructs of the three main constructs are also tested and reported.

To validate this PLS model, a global fit measure for PLS path modeling, the goodness of fit (GoF) [108], ranging from 0 to 1, is defined as the square root of average variance extracted (AVE) multiplying the average R^2 for endogenous constructs. GoF has been commonly used to determine the model fit for the estimated PLS model [109,110]. The criterion for GoF is 0.1, 0.25, and 0.36 for small, medium, and large effect sizes, respectively [111,112]. The GoF for the PLS model in this study is calculated as 0.45 exceeding the strictest criteria. Therefore, the causal relationships are sustainable for further analysis of the research model.

Table 4 lists the results in which composite reliability (CR) ranged from 0.89 to 0.93, and AVE ranged from 0.61 to 0.81. CR represents the ratio of a scale's estimated true score variance relative to its total variance, and AVE measures the reliability for the latent variable component score. These values all exceeded the recommended score of 0.7 for CR and 0.5 for AVE [113], indicating that the study has reliability and convergent validity. The square root of AVE, the numbers on the diagonal, was greater than the off-diagonal elements in the corresponding rows and columns, demonstrating an adequate discriminant validity for the study [113]. Another way to evaluate convergent and discriminant validity is to examine the factor loadings of each item. As shown in Table 2, items within the same construct are highly correlated, and no significant cross-loadings among constructs are observed [105]. Consequently, the results of content, convergent, and discriminant validity help this study further test the research model.

Table 4. CR, AVE, the correlation between constructs, and square roots of AVE.

Latent Variable	CR	AVE	1	2	3	4	5	6
1. Participating	0.91	0.68	0.82					
2. Browsing	0.91	0.63	0.46	0.79				
3. Bonding Social Capital	0.89	0.61	0.39	0.47	0.78			
4. Bridging Social Capital	0.93	0.62	0.41	0.59	0.57	0.78		
5. SCI (Giving)	0.93	0.81	0.46	0.39	0.39	0.48	0.90	
6. SCI (Receiving)	0.92	0.79	0.39	0.45	0.50	0.52	0.60	0.89

Notes: CR=Composite Reliability; AVE=Average Variance Extracted; Numbers on the diagonal are the square root of AVE. Other numbers are the correlations between constructs.

Common method variance (CMV) is a potential problem when collecting data from a survey. According to Harmon's test for measuring CMV [114], the extraction sum of squared variance for all of the items of constructs in the study is 24.69%, below the threshold of 50%. In addition, this

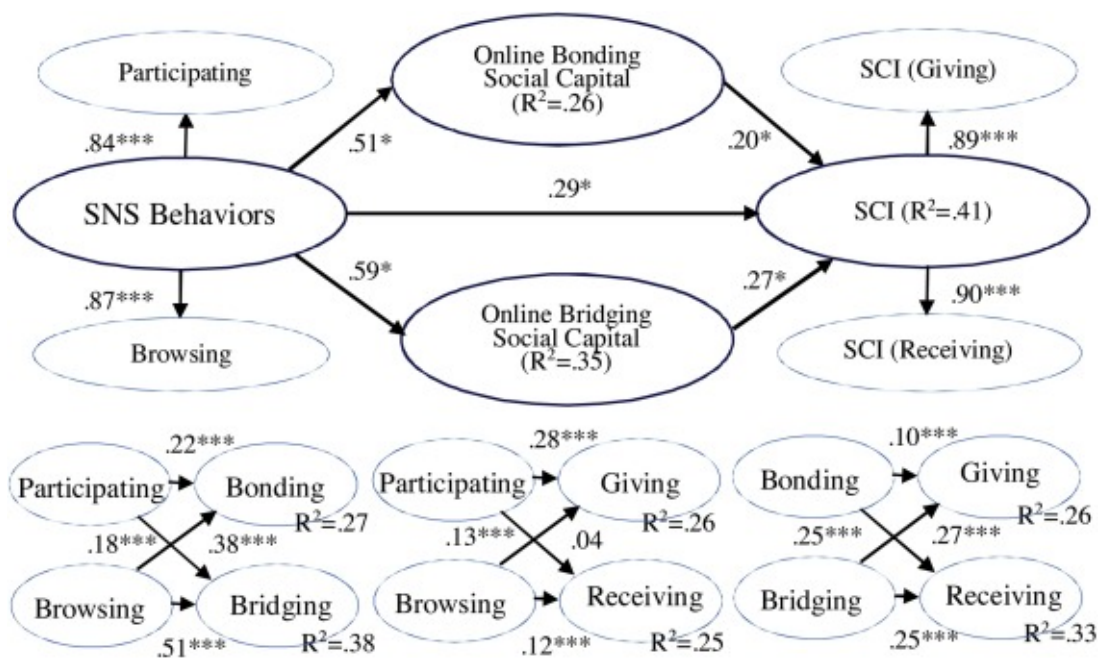
study also applied a common

constructs' indicators, and calculated each indicator's variances substantively explained by the principal construct and by the method [115]. The results showed that the average substantively explained variance of the indicators is 0.602, while the average method-based variance is 0.016. The ratio of substantive variance to method variance is approximately 38:1. As most factor loadings and the method variance are insignificant and are to be disregarded after testing with the method [115], common method biases are unlikely a contaminant of the results for further analysis.

4.3. Model fit evaluation and hypotheses testing results

The most widely used measure for a structural model is the coefficient of determination (R^2 value) [73]. It measures the research model's predictive accuracy and calculates the squared correlation between a specific endogenous construct's actual and predicted values. R^2 values of 0.19, 0.33, and 0.67 in PLS path models represent weak, moderate, and, substantial levels, respectively.

Furthermore, if inner path model structures explain an endogenous latent variable by only a few (e.g., one or two) exogenous latent variables, moderate R^2 may be acceptable [124]. The R^2 of SCI, as shown in Fig. 2, is 0.41 at the moderate level and is acceptable by this criterion. This study has tested the second-order constructs for SNS behavior, social capital, and SCI. The relationships among three second-order constructs are all positively significant. Most of the hypothesized relationships test significantly except for H8a2, for which browsing of SNS behavior does not have a significant impact on the giving of SCI.



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Fig. 2. Results of the PLS Analysis.

4.4. Mediation effect of online social capital between SNS behavior and SCI

To examine the mediation ef

first tested the direct effects between SNS behavior and SCI (H5), and then the influence of SNS behavior on bonding and bridging social capital (H1 and H2, respectively) and the influence of bonding and bridging social capital on SCI (H3 and H4, respectively). All of the five hypotheses show significant results. An approximate significance test, the Sobel test, was suggested for the indirect effect of the independent variable on the dependent variable through the mediator [79]. The results of the test are shown in Table 5. Z values of 5.09 and 6.84 are significant for bonding and bridging social capital as mediators between SNS behavior and SCI, respectively. Therefore, H6a, H6b, and H6 are all supported in this study. Additionally, variance accounted for (VAF) is commonly used to determine the percentages for the indirect effect of the total impact (i.e., direct effect plus indirect effect) [73]. When VAF is larger than 20% and less than 80%, it can be characterized as a partial mediation. The percentages of VAF for bonding and bridging social capital as mediators in this study are 25.66% and 35.75%, respectively, indicating that the relationships between SNS behavior and SCI are partially mediated by online bonding and bridging social capital.

Table 5. Mediating Effects of Bonding and Bridging Social Capital on Social Commerce Intention.

Relationship	Coef.	Std. Error	t Stat.	Z Stat.	Indirect Effect	Direct Effect	Total Effect ¹	VAF ²	Mediating Effect
H1 SNS behav. -> Bonding	0.51	0.03	19.87 ^{***}	5.09 ^{***}	0.10		0.39	25.66%	Partial Mediation
H3 Bonding -> SCI	0.20	0.04	5.26 ^{***}			0.29			
H2 SNS behav. -> Bridging	0.59	0.02	27.52 ^{***}	6.84 ^{***}	0.16		0.45	35.75%	Partial Mediation
H4 Bridging-> SCI	0.27	0.04	7.06 ^{***}						

***p < 0.01; **p < 0.05; *p < 0.1.

1

Total effect is equal to the summation of indirect and direct effects.

2

VAF: Variance Accounted For is equal to indirect effect divided by total effect.

5. Conclusions and discussion

5.1. Post hoc analysis

To obtain advanced and richer research explorations and findings from the model, this study conducted a post hoc analysis [116] to test which first-order constructs have stronger effects on

corresponding constructs. As

shown in Table 6. For example, the first pairwise comparison, H7a1 vs. H7a2, is to compare which SNS behavior, participating or browsing, has a higher impact on bonding social capital. Out of the six comparisons, four show significant results that are all significant at the confidence level of 0.01. However, the third comparison, H8a1 vs. H8a2, does not provide a meaningful conclusion because H8a2 was not supported. In general, for either bonding or bridging social capital, browsing of SNS behavior shows a stronger impact than participating SNS behavior. For giving intention of social commerce, bridging social capital has a stronger influence than bonding social capital.

Table 6. Post Hoc Analysis for Heterogeneity Testing Results.

Pairwise comparison	Coef.	t-value	Heterogeneity test (Z-Value)	Results
H7a1 vs. H7a2	0.22/0.38	6.66/11.66	-3.42 ^{***}	Browsing has a higher influence than participating on bonding social capital.
H7b1 vs. H7b2	0.18/0.51	5.06/15.08	-6.60 ^{***}	Browsing has a higher influence than participating on bridging social capital.
H8a1 vs. H8a2	0.28/0.04	8.05/1.10	4.77 ^{***}	No statistical conclusion since H8a2 is insignificant
H8b1 vs. H8b2	0.13/0.12	3.46/3.05	0.43	No difference
H9a1 vs. H9a2	0.10/0.27	2.67/6.53	-2.89 ^{***}	Bridging social capital has a higher influence than bonding social capital on giving intention of social commerce.
H9b1 vs. H9b2	0.25/0.25	6.56/6.00	0.10	No difference

^{***} $p < 0.01$; ^{**} $p < 0.05$; ^{*} $p < 0.1$.

5.2. Conclusions

This study is the first of its kind to integrate SNS behavior, social capital theory, and SCI into a research framework. SNS behaviors are hypothesized to affect SCI directly and indirectly through social capital. Each of the three second-order constructs is further divided into two first-order constructs, participating and browsing for SNS behavior, bonding and bridging for social capital, and receiving and giving for SCI. In addition to the second-order constructs, the relationships between first-order constructs are also tested. A post hoc analysis provided further analysis for this research. All of the results are shown in Table 7.

Table 7. Results of the hypotheses and post hoc analysis.

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Hypothesis	Results
H1 SNS behavior -> Bonding Social Capital	Supported
H2 SNS behavior -> Bridging Social Capital	Supported
H3 Bonding capital -> Social Commerce Intention	Supported
H4 Bridging capital -> Social Commerce Intention	Supported
H5 SNS behavior -> Social Commerce Intention	Supported
H6 SNS behavior -> SCI is mediated by Social Capital	Partially Mediated
H6a SNS behavior -> SCI is mediated by Bonding Social Capital	Partially Mediated
H6b SNS behavior -> SCI is mediated by Bridging Social Capital	Partially Mediated
H7a1 Participating of SNS behavior -> Bonding Social Capital	Supported
H7a2 Browsing of SNS behavior -> Bonding Social Capital	Supported
H7b1 Participating of SNS behavior -> Bridging Social Capital	Supported
H7b2 Browsing of SNS behavior -> Bridging Social Capital	Supported
H8a1 Participating of SNS behavior -> Giving of SCI	Supported
H8a2 Browsing of SNS behavior -> Giving of SCI	Not Supported
H8b1 Participating of SNS behavior -> Receiving of SCI	Supported
H8b2 Browsing of SNS behavior -> Receiving of SCI	Supported
H9a1 Bonding Social Capital -> Giving of SCI	Supported
H9a2 Bridging Social Capital -> Giving of SCI	Supported
H9b1 Bonding Social Capital -> Receiving of SCI	Supported
H9b2 Bridging Social Capital -> Receiving of SCI	Supported

Post Hoc Analysis

H7a1 vs H7a2	Browsing has a higher influence than participating on bonding social capital
H7b1 vs H7b2	Browsing has a higher influence than participating on bridging social capital
H8a1 vs H8a2	Inconclusive
H8b1 vs H8b2	No difference
H9a1 vs H9a2	Bridging has a higher influence than bonding social capital on the giving of SCI
H9b1 vs H9b2	No difference

5.3. Discussion and theoretical contributions

theory successfully predicts how SNS behaviors generate social capital that eventually leads to SCI. However, Social capital theory alone cannot fully explain the relationships among SNS behaviors, social capital, and SCI. According to the social exchange theory, SNS behaviors can lead to SCI directly, and the results of this study provide the necessary evidences.

SNS behaviors can influence SCI as well as social capital that is divided into bonding and bridging social capital. The results of H1 and H2 are consistent with the studies of [70] and [75], respectively. When considering knowledge sharing as a more general concept of social commerce, evidence has confirmed the relationship between social capital and knowledge sharing [53], equivalent to that between social capital and social commerce in this study. Interestingly, for the relationship between SNS behavior (participating and browsing) and social capital, a study showed the same results for H2, but demonstrated different conclusions for H1, the relationship between SNS behavior and bonding social capital [8]. When FB was initially established and promoted on campuses, it was popular mostly among young users, and this is probably why an earlier study by [70] could not find a positive relationship between SNS behavior and bonding social capital. However, several recent studies [14,118] have indicated that the average age of FB users has increased, and many elder users or parents of these young FB users have also entered the cyber world. Consequently, the relationship between SNS behavior and bonding social capital becomes significant in this study with recently collected data.

H3 and H4 are supported in this study, implying that both emotional support (bonding social capital) and information support (bridging social capital) are important factors encouraging users to conduct social commerce. The findings are consistent with [19] in which interacting with social network members who are either close or regular friends allows users to feel more comfortable in exchanging information. The result for H5 is similar to that of [17]. However, in their study, the referral intention was affected by browsing, not by participating.

This study integrated three constructs, SNS behavior, social capital, and social commerce into its model, and the results show that SNS behavior has a direct impact as well as an indirect impact through the online social capital on SCI. The three hypotheses regarding the mediating effects, H6, H6a, and H6b, all tested significantly. The partial mediating effects of bonding and bridging Social capital indicate that interactions with close friends (bonding social capital) and regular friends (bridging social capital) both support the users' intention to give and receive shopping information. Because social capital partially mediates the effect of SNS behavior on SCI, SNS behavior might lead to SCI directly. That is, an individual user could have SCI without having social capital by interacting with other online users. This could explain why some web services promote product information exchange and sharing on their site while users' interaction and blogging are limited or unavailable.

By further dividing each of the three constructs into two sub-constructs, this study is able to gain a better understanding regarding the interrelationships among these constructs of interest. All of the hypotheses of first-order constructs are significant except for H8a2, for which browsing of SNS behavior does not influence the giving of SCI. Apparently, the benefit of social status approval or helping others is not strong enough for browsing users to provide product-related information. These findings can be explained by a study distinguishing SNS viewers from posters, in which only

posters are motivated by reputa

SCI that is mediated by establishing social capital, either bonding or bridging. That is, when users accumulate either bonding or bridging social capital on an SNS, their browsing behavior will lead to the intention of social commerce. For the relationship between browsing SNS behavior and receiving SCI, the significant results of H7a2, H7b2, H8a2, H9a1, and H9a2 show that browsing SNS behavior has a direct impact on receiving SCI and an indirect impact on the receiving of SCI mediated by both bonding and bridging social capital. Participating in SNS behavior leads to giving and receiving of SCI directly, and the behaviors are mediated by bonding and bridging social capital indirectly.

The post hoc analysis provides more understandings and insights for this study. To accumulate social capital, browsing SNS behavior shows a stronger effect than participating in SNS behavior. These results apply to both bonding and bridging social capital. That is, for either close or regular friends, it is more effective for users to accumulate social capital by browsing than by participating. Results of other studies provide evidence to support this finding. Users of an SNS can derive enjoyment or pleasure from its contents and interactions with other members [119]. Enjoyment is a critical factor to reflect users' intrinsic acceptance of the World Wide Web [120] and an important factor to encourage users' activities on SNSs [50]. In a study comparing the behavioral intentions of viewers and posters on SNSs, enjoyment is the strongest factor to motivate viewers [121] and shows no influence on posters' behavioral intention.

For the post hoc results of H9a1 vs. H9a2, bridging shows a higher influence than bonding social capital on the giving of SCI. These results are contrary to those of the study by [22] regarding the factors influencing users' eWOM intentions in SNSs. Although not statistically tested in their study, the normative had stronger impacts than informative influences on eWOM intentions, including opinion seeking, giving, and passing. Normative influence has been considered to represent bonding social capital, while informative influence stands for bridging social capital [99]. The factors forming social capital might be the reason for these differences. In the early study [23], the bonding social capital was established primarily by users with common interests, and therefore, they would place a high value on the information within their online social networks. However, the bonding social capital in this study might have been accumulated by interacting with friends and family originally offline because more family members and elder users have begun using SNSs in recent years. Therefore, they place more trust on the information provided by regular friends who form the bridging social capital representing informative support [52]. Another explanation might be the ease of accessing information online. Formerly, people would consult trusted friends on certain topics. Users now can simply search for comments on particular products and browse those opinions, even though information providers are not close friends. Similar situations can also be found when users post questions that are answered by knowledgeable individuals who possibly gain some reputation on SNSs. Reputation is an intrinsic motivator for participating behavior [53] but is not a factor influencing viewers' behavior on SNSs [121].

In summary, this study contributes to the relevant literature in the following ways. First, although the importance of social commerce on SNSs has been identified and influential factors have been investigated by several studies [19,122,123], it presents the first attempt in the literature to use a model integrating SNS behavior, social capital, and SCI. Both SNS behaviors and social capital

influence SCI, while social ca

behaviors and SCI. Specifically, this study distinguishes the SNS behavior of participating and browsing from the SCI of receiving and giving product information. The results explain that SNS behavior may influence SCI directly or mediated indirectly through social capital, suggesting that users could be givers and/or receivers of product information without interacting with others on SNSs.

Second, in contrast with several prior studies, we find that SNS behaviors are positively associated with bonding social capital. As mentioned earlier, the increasing ages of FB users could be a key factor for these results. This group of FB users tends to interact with their relatives and/or old friends who form a strong tie with users. An avenue for future research would be to examine whether this change has a fundamental impact on the operations of FB.

Third, the study further divides each of the three constructs, including SNS behavior, social capital, and SCI, into two sub-constructs: participating and browsing, bonding and bridging social capital, and the giving and receiving of SCI. Overall, browsing and participating behaviors show different results when testing their impacts on the intention of giving social commerce, while other relationships all tested significantly. From the perspective of social commerce, this study provides evidence that browsing users are different from participating users. For browsing users to provide product information on SNSs, they need to build social capital by interacting with others.

Fourth, for both bonding and bridging social capital, browsing has a stronger influence than participating behaviors. Extant research [118,119] and our empirical results reveal that enjoyment is the strong factor connecting users with social capital and has a higher influence on browsing than participating users.

Lastly, bridging social capital has a stronger relationship with the intention of giving social commerce than bonding social capital. This result could be explained by the difference between normative and informative influence. Another explanation is the ease of accessing online information and, consequently, the desire to receive a higher reputation.

5.4. Managerial implications

The number of SNSs has been growing in recent years, and many of them have incorporated the function of social commerce to encourage their users to conduct business on their sites or to attract more advertisement sponsors. Naturally, users tend to interact with others on SNSs to accumulate social capital. Interactions with close and regular friends serve to accumulate bonding and bridging social capital, respectively. Based on the results of this study, some guidelines can be drawn for SNS operators to follow. First, both bonding and bridging social capital can help users receive product information on SNSs. However, when considering giving product information, bridging social capital is more effective than bonding social capital. SNS operators can design their sites so that it is easier for users to meet and interact with regular friends, or even strangers, if their purpose is to have more product information posted on their sites. Second, to accumulate either bonding or bridging social capital, browsing behavior is more effective than participating behavior. SNS behavior requires more effort on the design of web pages so that it is easy for users to navigate and find what they are looking for. Third, if resources are limited, participating and browsing behaviors can lead to receiving product information without accumulating social capital.

In other words, establishing :

is to encourage users to search and view product information on their sites. Last, browsing behavior does not lead to giving product information unless users can accumulate social capital. For users to be willing to provide product information, it is necessary for these users to interact and accumulate social capital on the site. In general, building social capital is a key factor for users in conducting social commerce behavior on SNSs. It is suggested that social commerce, giving and receiving product information, should be a secondary function when social interaction is the primary purpose of users' behavior on SNSs. SNS operators can direct users to other pages, pop-up windows, or a portion of the viewing window for social commerce behaviors when detecting product discussion during users' interactions.

5.5. Research limitations and future research

Although the research findings are interesting, this study has several limitations, the investigation of which present potential research topics. First, the empirical study used for evaluating our theoretical model was conducted on FB, the SNS with the most members in the world. However, a variety of SNSs mentioned in the literature and the results of this study implied that future studies should consider the characteristics of users on SNSs. For example, users of Twitter and users of FB might behave differently in terms of their SCI. Future studies should classify SNSs and then collect data from multiple SNSs representing each of the categories. Second, the relationship between SNS behavior and bonding social capital is significant in this study, but has been insignificant in prior studies. The factors involved in forming bonding social capital were not studied, and additional data should be collected to clarify this issue. Third, this study did not consider purchase intention or behavior when it is expected to be the extension of social commerce. Further studies can focus on the relationship between social commerce and purchase behavior, and the results could provide great academic as well as practical contributions.

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