

# **The Effects of Social Anxiety Moderating Social Factors for Influencing Social Commerce**

*Indicate Submission Type: Completed Research Paper*

**Chih-Lun Wu\***

**Qi-An Lu**

## **Abstract**

*Social commerce has become an important emerging issue on the Internet. Researchers have studied not only online factors but also offline factors. Hence, this study investigated the effect of social anxiety, an offline psychological characteristic, on online users' behavior. Online social interactions are hypothesized to influence social commerce intention directly or indirectly through online social support. Online social support is divided into two forms, informational and emotional. Social commerce intention is also decomposed into receiving and giving resulting in eight causal relationships. 427 effective samples are collected from Facebook users, and the results confirmed most of the causal effects of the research model. The Study also tested the moderating effect of social anxiety on all of the causal effects. Out of the eight relationships, social anxiety significantly moderates four of them. Findings of the results lead to significant theoretical contributions and managerial implications. Limitation and future research directions are also discussed.*

**Key Words:** Social anxiety, online social interaction, online social support, social commerce

## **Introduction**

Since social networking sites (SNS) are applications that enable online users to connect by creating personal profiles and providing information, inviting friends and colleagues to access their files, and sending e-mails, instant messages, and footage between friends. These personal profiles can include various types of information including photos, videos, audio files, and public bulletin boards blogs (Kaplan and Haenlein 2010). Since SNS emerged in the cyber world, many online users have joined and become members of them. Through the inter-personal social activities, which are based on various applications, SNS members actively participate the online activities to practice their social lives and accumulate social capital (Boyd 2009).

Since users might act differently between virtual and real worlds, offline and online user behaviors have become important research topics (Koufaris 2002). Both online and offline influences such as personality and psychological factors have played important roles for users to take part in SNS (Nadkarni and Hofmann 2012). Out of these factors, social anxiety and the online-to-offline factor have received increasing empirical attention (Pierce 2009). Socially anxious individuals who are also named social phobia are increasing dramatically in parallel with the rapid growth of the Internet (Anderson and Hope 2009). Social anxiety is the most common anxiety for a personal life prevalence that accounts for more than 12% of the human population (Heeren et al. 2015; Stein and Stein 2008). They often fear to talk in public or meet with strangers and are uneasy about making new friends in the real world (Prizant-Passal et al. 2016). Therefore, this research will investigate the role of social anxiety on social commerce intention. When online users are interested in shopping information, those who have high social anxiety might behave differently from those with low social anxiety offline.

SNS may be regarded as a friendly environment to develop personal social life because individuals are invisible allowing them to avoid physical face-to-face contact and feel more comfortable (Pierce 2009; Prizant-Passal et al. 2016). Hence, they may be more willing to contact and interact with others online compared to offline. Moreover, social commerce is established through the sharing of information, knowledge and shopping experience about products or services with other online users, and can be considered a type of electronic word of mouth (eWOM) (Liang et al. 2011; Liang and Turban 2011). It is burgeoning tremendously due to the growth of SNS and their users (Ng 2013). According to the Forrester Research report, the social commerce market has grown to approximately US\$30 billion in the U.S. in 2018.

This study attempts to explore how social anxiety influences online users' social commerce intention on SNS. We posit online social interaction as an antecedent to predict online social supports that lead to social commerce intention (SCI). The results could provide suggestions to SNS operators on how to run SNS more effectively and efficiently from the users' perspective. One of the primary purposes of the study is to investigate whether socially anxious individuals who feel more comfortable on the Internet (Caplan 2007; Prizant-Passal et al. 2016), are more likely to adopt social commerce on SNS, compared to less socially anxious individuals.

Prior research found that high level of social anxiety was associated with the usage and visiting frequencies of SNS (McCord et al. 2014) and lower levels of social anxiety and the greater extraversion were associated with the more preferring attitude towards face-to-face activities (Grieve et al. 2017). Very few research explores the role of social anxiety on social commerce. Therefore, the main purpose of the study is to investigate the moderating effect of social anxiety on the relationships between online social interaction, online social supports, and social commerce intention.

In summary, the purposes of the study are to:

- explore how social anxiety as a moderator that influences the relationships between online social

interaction to online social support including information and emotional support.

- Understand social anxiety as a moderator that affects the relationships between online social support including information and emotional support to SCI-giving and SCI-receiving, respectively.
- Comprehend social anxiety as a moderator to impact the relationships between online social interaction to SCI-giving and SCI-receiving, respectively.

## **Literature Review and Theoretical Development**

### **Social Exchange Theory**

Social exchange theory proposes that individuals' social behavior is the result of an exchange process, and the purpose of the exchange is to maximize benefits and minimize costs (Leventhal et al. 1980). According to this theory, people consider and measure the potential benefits and costs of social relationships. 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. The benefits are the things the individuals acquire from relationships such as friendship, emotions, companionship, and online social support. The theory proposes that individuals essentially take the benefits and minus the costs in order 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 more than the benefits (Cherry 2013). Therefore, the theory suggests that individuals employ cost-and-benefit analysis to evaluate their social relationships and engage in social exchange only when the benefits outweigh the costs (Blau 1964).

### **Social Compensation Theory**

Social compensation theory (SCT) postulates that the Internet provides users who feel uncomfortable to engage in face-to-face activities a more pleasing choice (Weidman et al. 2012). Therefore, individuals who possess high social anxiety and low social skills typically have difficulties forming interpersonal relationships in face-to-face interactions and will adopt online activities to compensate for deficits they encounter in the offline world (Poley and Luo 2012). The Internet offers an alternative approach to nonsocial uses such as information seeking or playing games, exacerbating social withdrawal. Consequently, shy individuals are more likely to utilize the Internet to experience their social life and enhance their social relationships that might be considered more difficult during face-to-face physical interaction (Amichai-Hamburger and Vinitzky 2010). Hence, socially anxious individuals turn to the Internet to communicate and form relationships with peers, because these interactions are more difficult in person (Laghi et al. 2013). According to SCT, individuals may like to turn to the online environment to compensate for their social relationship while they may lack an offline social relationship with others (Grieve et al. 2017). Therefore, this study will apply SCT in order to explain the behaviors of socially anxious individuals on the SNS for their willingness to adopt social commerce intention (SCI).

SCT has been applied for the study of social anxiety on the Internet. However, prior studies seemed to focus on individuals either with high social anxiety (HSA) or low social anxiety (LSA). McCord et al. (2014) found that HSA was correlated with more frequent SNS visits, and Indian and Grieve (2014) suggested that online social support from Facebook was associated with greater subjective well-being. On the other hand, Grieve et al. (2017) found that lower levels of social anxiety and greater extraversion were correlated to more favorable attitudes towards face-to-face contact activities.

## **Social Anxiety**

Social anxiety, the same as the otaku phenomenon (Galbraith 2010), is defined as “a state of anxiety resulting from the prospect or presence of interpersonal evaluation in real or imagined social settings” (Leary 1983); it is characterized by an extensive fear of being evaluated by others (Wieser et al. 2010); and it is also regarded as a form of shyness (Madell and Muncer 2006). It is an anxiety disorder characterized by an intense fear of social situations causing considerable distress and impaired ability to function in at least some parts of daily life (Prizant-Passal et al. 2016). Socially anxious individuals describe their relationships with family, friends, and even partners as damaged (Erwin et al. 2004). The Internet can be considered as a communication tool to avoid contacting people face to face (Lee and Stapinski 2012; Prizant-Passal et al. 2016). Therefore, SNSs such as Facebook and Twitter provide HSA individuals with a friendly environment to communicate with others and help them to expand their social life in the cyber world without interacting others face to face in the real world.

## **Online Social Interaction**

Individuals develop a preference for online social interaction as an alternative to face-to-face communication because they perceive it to be less threatening and perceive themselves to be more efficacious when interacting with others online (Caplan 2003). Researchers have identified two primary uses of online social interaction. The first one is for users to find others with similar interests ranging from romantic relationships to social networks (Correa et al. 2010), and another one is to maintain pre-existing social connections in actual life (Ellison et al. 2007). Most online users visit SNSs to keep in touch with persons they already knew in real life (Lenhart et al. 2010). Besides, studies have shown that many online relationships were initially established in real-world contacts (Ross et al. 2009).

## **Online social support**

Social support refers to an individual’s experiences of being helped by people, being responded to, and being cared for in that individual’s social group (House 1981). Because social support can create warmth and understanding for an individual, it can also be treated as a responsiveness to satisfy one’s psychological needs (Maslow, Frager, Fadiman, McReynolds, and Cox 1970). The definition of social support varies from one study to another, but it is widely acknowledged that online social support has multiple dimensions including emotional, instrumental, appraisal, and informational (Bo 2008; House 1981).

Online social support, often considered as a multi-dimensional construct, including informational support, emotional support, and tangible support (Schaefer et al. 1981). As the study tries to comprehend the social factors for users to build their online relationships, and the effects of such relationships on social commerce intention, the study chose informational and emotional supports as the two dominant types of social support in this research. Hence, the study decomposed into information and emotional supports (Chen and Shen 2015; Liang et al. 2011)

The experiences of online social support by socially anxious individuals in a social network may also help them to avoid negative experiences (e.g., economic or legal problems) that otherwise would increase the probability of psychological or physical disorder (Cohen and Wills 1985). When SNSs have become parts of people’s lives in recent years, the role of the Internet has changed to become an effective and efficient way for individuals to facilitate social interaction (Liang et al. 2011).

## **Social Commerce in SNS**

Following the fast-growing development of popular SNSs such as Facebook, LinkedIn, and Twitter, social commerce has become an important topic (also known as a social business) in the virtual world. Social Commerce Today (2011) defined SC as “The use of social technology in the context of commerce for selling with social media.” It involves adopting Web 2.0 social media technologies and infrastructures to support online interpersonal interactions to acquire shopping information about

products and services. In addition, it refers to transactions via social media, and delivery of e-commerce activities, usually by applying Web 2.0 software in social media (Liang et al. 2011; Liang and Turban 2011). Hence, SC can be regarded as a subset of e-commerce that involves by adopting social media as a platform to assist e-commerce processes such as transactions and activities.

Dennison et al. (2009) defined social commerce as having taken eWOM where it never existed before in online shopping. Online users are now seeking ways to learn from each other’s shopping expertise and experiences in order to get more information to make effective purchasing decisions. Simply speaking, social commerce is word-of-mouth utilized in e-commerce.

Social commerce intention was measured in one construct in one of the early study (Liang et al. 2011). They stated, “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” when developing the measurement of SCI. In this statement, they clearly had two categories for SCI, giving shopping information and receiving shopping information. Therefore, SCI was divided into two forms, receiving and giving to have a better understanding of users’ behavior in SNS.

Since actual behaviors of social commerce are difficult to be quantified, the intention is a common measurement for behavioral researchers to predict possible human actions. A large body of research has proven that behavioral intention has a significant correlation with actual behavior such as the theory of reasoned action, the theory of planned behavior, and the technology acceptance model. Hence, this study utilizes social commerce intention (SCI) to represent social commerce behavior.

## Methodology

### Research Framework

The study seeks to explain the relationships among social anxious, online social interaction, online social support, and social commerce intention. The research framework is shown in Figure 1. Online social support, decomposed into information and emotional supports, is hypothesized as a mediator between online social interaction and social commerce intention. In addition, social anxiety is expected to moderate all of the causal relationships including online social interaction to online social supports, online social supports to social commerce intention, and online social interaction to social commerce intention.

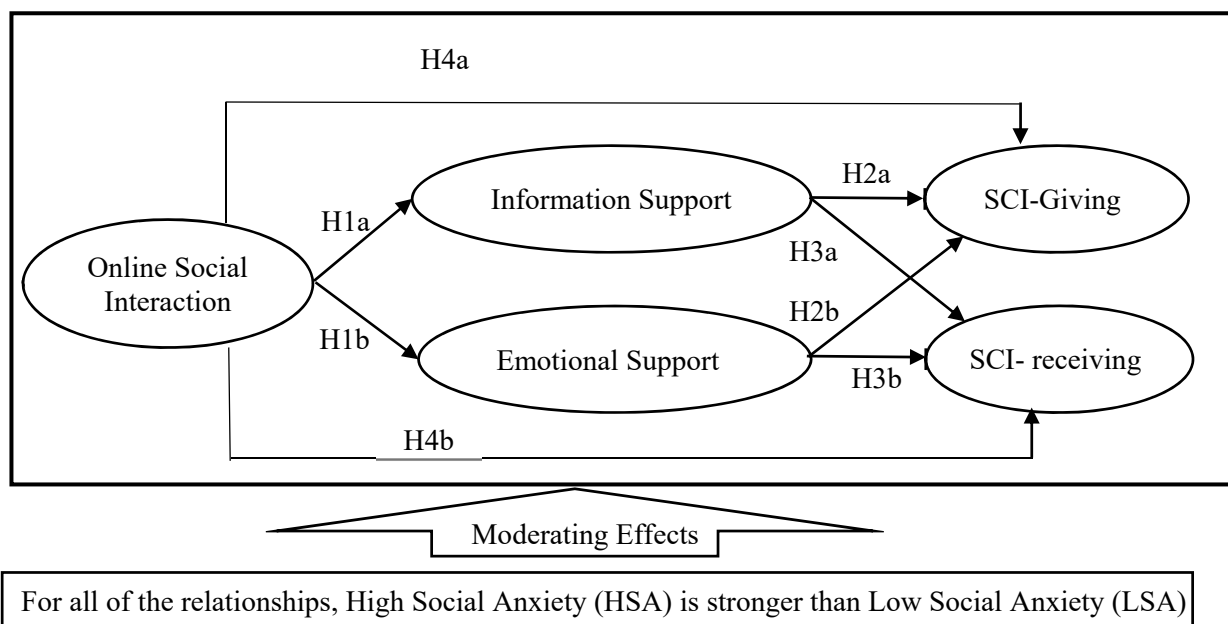


Figure 1. Research Framework

## **Research Hypothesis**

Since this paper is focusing on the moderating role of social anxiety on all of the causal effects, the hypotheses development will first rationalize the causal relationships and then discuss the moderating effect of social anxiety on the relationships. Online social support is one of the benefits and an important factor for people to maintain interpersonal relationships. Individuals will reciprocate online social support from others and behave similarly in social interactions. Therefore, frequent social interaction with other users can be interpreted as a high level of online social support (Rook 1984). Human beings need social interactions to satisfy their social needs for belonging and support (Liang et al. 2011; Maslow et al. 1970), and SNS provides a platform for online users to interact with each other and to exchange informational and emotional support with their knowledge and personal experiences (Kaplan and Haenlein 2010; Liang et al. 2011).

Lee and Stapinski (2012) proposed face-to-face avoidance, an important element of social anxiety, is found to be significantly associated with online social interaction (Liebowitz et al. 1985). According to the social compensation theory, socially anxious individuals may compensate for poor offline relationships by seeking their social life in the cyber work. Therefore, they may have more online social interaction to anticipate higher online social support including information and emotional to compensate their fear of contacting with people in real life (Lee and Stapinski 2012). Selfhout et al. (2009) also suggested that the Internet might promote online friendships at the expense of face-to-face social networks. Hence, compared to LSA, individuals with HSA may perceive higher online social support including information support and emotional, when they show stronger online social interaction. In addition, those individual with high social anxiety perceived higher satisfaction in computer-mediated communication (CMC) than in face-to-face (FTF) situations while users with low social anxiety showed no differences between CMC and FTF environments (Shalom et al. 2015). Therefore, this study hypothesizes:

**H1a: Social interaction will correlate with information support. Social anxiety will positively moderate the relationship between online social interaction and information support.**

**H1b: Social interaction will correlate with emotional support. Social anxiety will positively moderate the relationship between online social interaction and emotional support.**

Based on the social exchange theory, when individuals acquired benefits from others, they reciprocate others' support (Cropanzano and Mitchell 2005; Emerson 1976). A growing number of studies have provided concrete evidence that CMC can help form and maintain online relationships to facilitate the exchange of online social support (Jang et al. 2016; Steinfield et al. 2008). An SNS is an IT platform for online users to share different forms of support such as emotional and informational. The interchange motivation resulting from the perception of online social support encourages online users to share purchasing experience, shopping information, product knowledge, and even brand loyalty with their online friends by e-word-of-mouth (eWOM) and to receive feedback from other online users. Hence, online social support enhances the social commerce intention on SNSs.

Previous research has found that socially anxious individuals are likely to strengthen their Internet interactions in order to avoid face-to-face interactions (Prizant-Passal et al. 2016). Also, Kraut et al. (2002) suggested that socially anxious individuals who spent a large amount of time interacting with others on the Internet were more likely to express greater comfort in interactions and higher reliance on the Internet as a social outlet to the exclusion of face-to-face interactions. These people were more inclined to proclaim they are comfortable initiating and maintaining an online relationship with others and prefer discussing their problems with others on the Internet rather than face-to-face interactions.

Following the above statements, socially anxious individuals have a strong intention to explore the online relationships they perceive less threateningly than traditional face-to-face interactions that others may use (Stevens and Morris 2007). Virtual social situations are especially suitable for measuring overt attention in an ecologically valid environment (Mühlberger et al. 2008). Thus, socially anxious individuals may prefer and trust online users' opinions and experiences rather than people in real life.

Previous studies have found that online social support positively influences the usages of SNS for HSA (Indian and Grieve 2014; McCord et al. 2014). Since socially anxious individuals fear to contact with others in real life, they might rely more on online social support, including informational and emotional, that leads to SCI of giving to and receiving from other users on the SNS. Moreover, Liang et al. (2011) conducted their study on Plurk, a microblog SNS site, and their results confirmed the relationship between online social support and social commerce intention. By dividing social support into informational and emotional, and social commerce intention into receiving and giving, respectively, this study tries to explore their relationships more comprehensively. Therefore, this study proposes:

**H2a: Information support will correlate with SCI-giving. Social anxiety will positively moderate the relationship between information support and SCI-giving.**

**H2b: Emotional support will correlate with SCI-giving. Social anxiety will positively moderate the relationship between emotional support and SCI-giving.**

**H3a: Information support will correlate with SCI-receiving. Social anxiety will positively moderate the relationship between information support and SCI-receiving.**

**H3b: Emotional support will correlate with SCI-receiving. Social anxiety will positively moderate the relationship between emotional support and SCI-receiving.**

Chen et al. (2011) stated that WOM is a well-established construct in the marketing literature. Dennison et al. (2009) defined social commerce as a type of WOM utilized in e-commerce, and SC also can be considered as a form of social interaction in which shopping information and purchasing experiences are exchanged. Furthermore, when online users conduct more online interactions about products and services information, knowledge, and shopping experience with others, these actions will create a special atmosphere leading to a stronger social commerce intention (Liang et al. 2011).

According to social compensation theory (SET) (Grieve et al. 2017), socially anxious individuals fear to communicate with others in real life, and frequent online social interactions will strengthen their willingness to give and receive product information. Therefore, individuals, compared to others with lower social anxiety, will have higher intentions to conduct social commerce. Hence, this study proposes:

**H4a: Online social interaction will correlate with SCI-giving. Social anxiety will positively moderate the relationship between online social interaction and SCI-giving.**

**H4b: Online social interaction will correlate with SCI-receiving. Social anxiety will positively moderate the relationship between online social interaction and SCI-receiving.**

## **Research Method**

This study applied the partial least squares (PLS) method for structured equation analysis to test the causal effects of the research model. PLS includes a measurement model and a structure model simultaneously (Hair and Anderson 2010). The measurement model tests the relationship between observed and latent variables, while the structural model based on certain assumptions explores the causal effects of latent variables. The study adopted SmartPLS 2.0 to analyze the measurement model and the structure model simultaneously. The validity of the constructs was assessed on unidimensionality, internal consistency, convergent, and discriminant validity.

## **Results and Analysis**

### **Data Collection**

Because the questions based on the literature review are presented in English and the samples in this study do not use English as the native language, this study translated them from English to Chinese. To ensure the measurement of items with precise interpretation from English to Chinese, four professionals with sufficient English proficiency proceeded backward translation. They translated those items

forward (English to Chinese) and backward (Chinese to English) several times until the meanings of the items were consistent.

Facebook is the SNS with most active users and has provided research samples under scrutiny (Valenzuela et al. 2009). Therefore, it is appropriate to collect samples from Facebook to test the research model of this research. Seven items with low loadings were deleted after the pilot test. The questionnaires were distributed from March 1 to April 10, 2015. Out of 450 samples, 23 samples with incomplete data were deleted resulting in an effective sample collection rate of 94.9%. Female and male samples account for 62.2 % and 37.7%, respectively. The distribution of gender is similar to another survey (Smith 2015). Most of the respondents are college students, aged less than 22 (83.8%), and have more than two years of SNS experience (78.5%).

## Reliability and Validity

The construct measurements, including questions, loadings, and sources, are shown in Table 1. All of them have standardized loadings ranging from 0.72 to 0.95. A higher value represents a stronger relationship between the item and its corresponding construct, and a value larger than 0.7 is considered acceptable (Chin 2010).

**Table 1 Measurement Items**

Constructs	Item	Questions	Loadings	Source
Social Anxiety	Sax1	Afraid (Sum up 24 items from Liebowitz's Social Anxiety Scale)	0.910***	(Liebowitz et al. 1985)
	Sax2	Avoidance (Sum up 24 items from Liebowitz's Social Anxiety Scale)	0.950***	
Online Social Interaction (Social Control)	Sco1	When I am online, I socialize with other people without worrying about how I look	0.745***	(Caplan 2003)
	Sco2	I can control how others perceive me when online	0.827***	
	Sco3	When I am online, I socialize with people without worrying about relational commitment	0.746***	
Online Social Interaction (Social Benefits)	Sbe1	I am treated better in my online relationships than in my face-to-face relationships	0.898***	(Caplan 2003)
	Sbe2	I am more confident socializing online than I am offline	0.886***	
	Sbe3	I feel safer relating to people online rather than face-to-face	0.890***	
Online social support (Informational)	Ims1	On Facebook, some people offer suggestions when I need help	0.880***	(Krause and Markides 1990)
	Ims2	When I encounter a problem, some people on Facebook give me information to help me overcome the problem	0.915***	
	Ims3	When faced with difficulties, some people on Facebook help me discover the cause and provide me with suggestions	0.880***	
Online social support (Emotional)	Ems1	When faced with difficulties, some people on Facebook are on my side	0.894***	(Krause and Markides 1990)
	Ems2	When faced with difficulties, some people on Facebook comfort and encourage me	0.925***	
	Ems3	When faced with difficulties, some people on Facebook listen to me talk about my private feelings	0.717***	
	Ems4	When faced with difficulties, some people on Facebook express interest and concern in my well-being	0.908***	
Social Commerce Intention (SCI-Giving)	Giv1	I am willing to provide my experiences and suggestions when my friends on Facebook want my advice on buying something	0.849***	(Liang et al. 2011)
	Giv2	I am willing to share my own shopping experience with my friends on Facebook	0.916***	
	Giv3	I am willing to recommend a product that is worth buying to my friends on Facebook	0.907***	
Social Commerce Intention (SCI-Receiving)	Rec1	I will consider the shopping experiences of my friends on Facebook when I want to shop	0.884***	(Liang et al. 2011)
	Rec2	I will ask my friends on Facebook to provide me with their suggestions before I go shopping	0.879***	
	Rec3	I am willing to buy the products recommended by my friends on Facebook	0.851***	

Notes: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .



**Table 2. CR, AVE, Correlation between Constructs, and Square Roots of AVE**

	<b>Composite Reliability</b>	<b>R<sup>2</sup></b>	<b>AVE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>1</b> Social Interaction-Social Control	0.817	0.649	0.598	<b>0.773</b>					
<b>2</b> Social Interaction - Social Benefit	0.921	0.802	0.794	0.458	<b>0.891</b>				
<b>3</b> Information Support	0.921	0.037	0.795	0.236	0.108	<b>0.892</b>			
<b>4</b> Emotional Support	0.922	0.049	0.749	0.218	0.164	0.715	<b>0.865</b>		
<b>5</b> SCI - Giving	0.921	0.174	0.795	0.147	0.160	0.391	0.357	<b>0.891</b>	
<b>6</b> SCI - Receiving	0.904	0.186	0.759	0.145	0.115	0.404	0.387	0.747	<b>0.871</b>

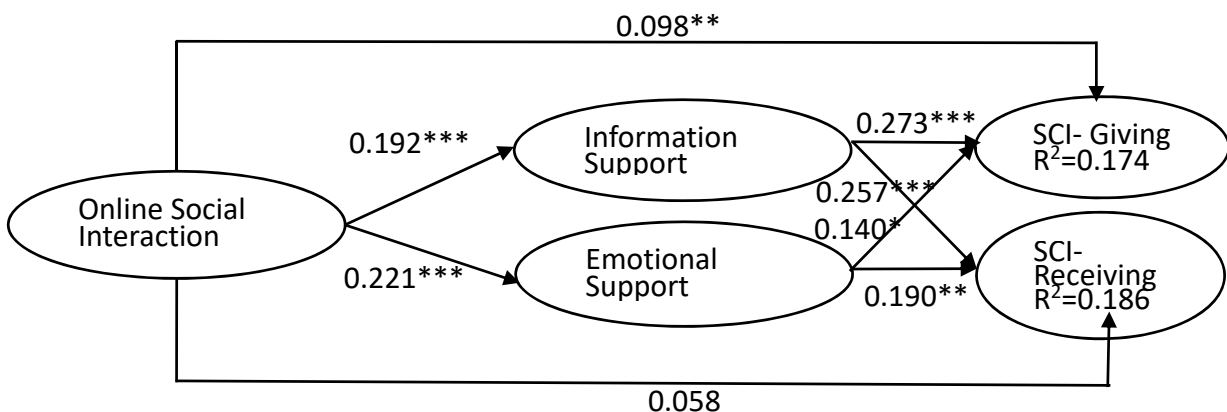
Notes: CR=Composite Reliability; AVE=Average Variance Extracted; Numbers on the diagonal (in boldface) are the square root of the average variance extracted (AVE). Other numbers are the constructs' correlation.

Table 2 lists the results in which composite reliability (CR) ranged from 0.817 to 0.922, and AVE ranged from 0.598 to 0.795. Composite reliability represents the ratio of a scale's estimated true score variance relative to its total variance, and AVE measures the reliability of the latent variable component score. These values all exceeded the recommended score of 0.7 for CR and 0.5 for AVE (Fornell and Larcker 1981), respectively, indicating that the study has reliability and convergent validity. For the discriminant validity, the square root of AVE, the numbers on the diagonal, were greater than the off-diagonal elements in the corresponding rows and columns, demonstrating an adequate discriminant validity for the study (Fornell and Larcker 1981).

According to Harmon's test for measuring common method variance (CMV) (Babin et al. 2016), all of the indicators are measured by factor analysis with one factor. If the extracted sums of the squared variance are more than 50%, a potential CMV problem may exist. The extracted sum of squared variance for the constructs in the study is 34.816 %, indicating that common method biases are unlikely to contaminate our results.

### Model Fit Evaluation and the Hypotheses Testing Results

Hair Jr et al. (2017) proposed that the most widely applied way of measuring the structural model is the coefficient of determination (R<sup>2</sup> value). It is a measure of the research model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. The results of the model are shown in Fig. 2. The R<sup>2</sup> of the research is 0.11, 0.16, and 0.21, all exceeding the acceptable level. (Hair Jr and Hult 2016). Seven out of eight causal effects test positive in which four are significant at 0.01 and the other two are significant at 0.05.



**Figure 2 Results of the PLS Analysis for the Full Research Model**

After analyzing the full model, the samples are divided into three groups based on the scores of social anxiety. Removing the group around the medium point results in two groups, one with high social anxiety (HSA) and the other one with low social anxiety (LSA). Next, we proceed the multi-group analysis to test the moderating effects of social anxiety (Hair Jr and Hult 2016; Hair Jr et al. 2017).

**Table 3 The Results of Multi-Group Analysis (MGA) for High and Low Social Anxiety**

Hypotheses	Causal effect (full model)		High social anxiety		Low social anxiety		Diff. test	
	Coeff.	Coeff.	t-value	Coeff.	t-value	t-value	Sig.	
H1a: Online Social Interaction -> Information Support	0.192***	0.583	10.333***	0.173	2.249**	4.337***	0.000	
H1b: Online Social Interaction -> Emotional Support	0.221***	0.576	11.734***	0.163	2.026**	4.419***	0.000	
H2a: Informational Support -> SCI-Giving	0.273***	0.397	3.841***	0.418	3.696***	-0.136	0.892	
H2b: Emotional Support -> SCI-Giving	0.140*	-0.035	0.317	0.134	1.531*	-1.216	0.227	
H3a: Informational Support -> SCI- Receiving	0.257***	0.251	2.192**	0.496	4.358***	-1.531	0.129	
H3b: Emotional Support -> SCI-Receiving	0.190**	-0.089	0.744	0.140	1.108	-1.327	0.187	
H4a: Online Social interaction -> SCI-Giving	0.098**	0.439	6.935***	0.102	1.452*	3.609***	0.000	
H4b: Online Social Interaction -> SCI-Receiving	0.058	0.474	9.149***	-0.006	0.075	5.308***	0.000	

\* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001

The results in Table 3 support parts of the hypotheses in this study. Social anxiety significantly moderates the relationships between online social interaction and online social support (H1a and H1b), and between online social interaction and social commerce intention (H4a and H4b). For the relationships between online social support and social commerce intention (H2a, H2dm H3a, and H3b), social anxiety does not show significant moderating effect.

## Conclusions and Future Research

### Conclusions and theoretical contributions

This study applied social compensation theory and social exchange theory to explain how socially anxious users behave online toward social commerce. Social compensation theory states that people may show different characters or behaviors in various environments, and the results of this study assert that SCT is suitable for explaining offline-to-online (O2O) effects for SNS users with various degree of social anxiety. In addition, this study is the first to investigate the moderating role of social anxiety toward social commerce, and the results have significant contributions to theoretical contributions.

**Table 4 Results of the Hypotheses**

Hypothesis	Causal Effects	Moderating Effects
H1a Online Social Interaction -> Informational Support	Supported	HSA>LSA Supported
H1b Online Social Interaction-> Emotional Support	Supported	HSA>LSA Supported
H2a Informational Support -> SCI-Giving	Supported	HSA>LSA Not Supported
H2b Emotional Support-> SCI-Giving	Supported	HSA>LSA Not Supported
H3a Informational Support -> SCI-Receiving	Supported	HSA>LSA Not Supported
H3b Emotional Support-> SCI-Receiving	Supported	HSA>LSA Not Supported
H4a Online Social Interaction-> SCI-Giving	Supported	HSA>LSA Supported
H4b Online Social Interaction-> SCI-Receiving	Not Supported	HSA>LSA Supported

The results of hypotheses are shown in Table 4. As mentioned previously, researchers have conducted studies for the relationship between social anxiety and usages of SNS (Indian and Grieve 2014; McCord et al. 2014). However, the role of social anxiety on social commerce was not identified and investigated. This research is the pioneering study to discuss social anxiety as the moderator in the model to influence the relationships between social factors, including online social interaction and online social support, and social commerce. The results supported parts of the hypotheses indicating that the moderating effect of social anxiety is significant on the relationships when online social interaction is antecedents of social support and social commerce (H1a, H1b, H4a, and H4b). Users with HSA show stronger influences by online interactions on social support and social commerce intentions. When individuals with HSA fear direct contacts with other individuals offline, their interactions with online users have a stronger influence on their corresponding behavior such as social support and social commerce. These individuals do not have a strong need to compensate for their behavior after interacting with other users online. This is probably why social anxiety shows the insignificant moderating effect on relationships between social support and social commerce intention (H2a, H2b, H3a, and H3b).

Out of the eight causal effects in the full model, only the relationship between online social interaction and receiving of SCI shows no significant result. When considering social commerce similar to eWOM, the results by Hennig-Thurau et al. (2004) have shown various causes to receiving and giving of social commerce. The intention of receiving product information is affected consistently by informational support in which the results from the full model, HSA, and LSA are the same. Emotional support influences receiving of SCI on full model, but not on HSA and LSA. For the relationship between online social interaction and receiving of SCI, the significant result is only discovered for HSA.

Moreover, the relationship between emotional support and giving of SCI is only insignificant for HSA. Based on the social exchange theory, users with HSA will need higher emotional than those with LSA to perceive positive benefit when giving product information. It is possible that that socially anxious individuals do not consider emotional support enough to make up their costs of giving product information. The highly significant results of H2a for HSA indicate that information of the product socially anxious users require is much more valuable than emotional support.

In general, since social commerce involves information exchange, information support plays a more important role than emotional support. On the other hand, users with HSA seem to have a higher threshold to reach a satisfactory level emotionally.

## **Managerial Implication**

According to research findings, it reveals online social interaction influences information to support and emotional support for both HSA and LSA groups. They may try to increase online social interaction to social support including information and emotional support for their online users' application. They may create the SNS as the platform to let users' exchange their feelings and production information feel free and no obstacles. Hence, if SNS operators like to increase the online users let them join the SNS, they may stipulate more communication tools and functions for their users to easily to exchange their information and feelings easily.

In addition, if SNS operators like to increase the posting of product information on their SNS, the effective way is to design their platforms so that the information exchange is convenient and efficient. If the target users or primary users of an SNS are those with relatively HSA, they will have more online social interactions to information and emotional support on the SNS and high social interaction will also influence the social commerce for giving and receiving. These users will also search and posting product information for informational support, but not for emotional support. Therefore, for promoting social commerce, the SNS operators may encourage brand firms or online users to create their fans pages. In the fan pages, they may deliver or exchange their comments and experiences about using the product information. With HSA, the SNS may encourage them to join for online social interaction and finally promote to deliver and exchange the product information and experiences. On the contrary, with the LSA, the SNS may just deliver and exchange the product information

Furthermore, only information support directly influences SCI-giving and SCI-receiving for both HSA and LSA groups. It appears SNS operators may enhance SNS as the information platform effectively and efficiently instead of regarding SNS as an emotional platform while they try to develop social commerce in the SNS.

General speaking, when these SNS operators who may like to promote social commerce, HSA is the potential for target customers comparing with the LSA while online social interaction, directly and indirectly, influences SCI-giving and SCI-receiving. Therefore, SNS operators may propose and stipulate more online interaction and information support comparing to provide only information for LSA needed. SNS operators may not utilize their SNS for emotional-related support for both two groups that emotional support have no effects on SCI-giving and SCI-receiving.

Therefore, the strategies for SNS operators to increase online users' populations (make more functions to exchanging information and emotional support) or promote social commerce (encourage users to join the fan pages) may be quite different following the research findings.

## Reference

- Amichai-Hamburger, Y., and Vinitzky, G. 2010. "Social Network Use and Personality," *Computers in Human Behavior* (26:6), pp. 1289-1295.
- Babin, B. J., Griffin, M., and Hair Jr, J. F. 2016. "Heresies and Sacred Cows in Scholarly Marketing Publications," *Journal of Business Research* (69:8), pp. 3133-3138.
- Blau, P. M. 1964. *Exchange and Power in Social Life*. Transaction Publishers.
- Boyd, D. 2009. "Why Youth (Heart) Social Network Sites: The Role of Networked Publics in Teenage Social Life,").
- Caplan, S. E. 2003. "Preference for Online Social Interaction: A Theory of Problematic Internet Use and Psychosocial Well-Being," *Communication Research* (30:6), pp. 625-648.
- Caplan, S. E. 2007. "Relations among Loneliness, Social Anxiety, and Problematic Internet Use," *CyberPsychology & Behavior* (10:2), pp. 234-242.
- Chen, J., and Shen, X.-L. 2015. "Consumers' Decisions in Social Commerce Context: An Empirical Investigation," *Decision Support Systems* (79), pp. 55-64.
- Chen, Y., Wang, Q., and Xie, J. 2011. "Online Social Interactions: A Natural Experiment on Word of Mouth Versus Observational Learning," *Journal of Marketing Research (JMR)* (48:2), pp. 238-254.
- Cherry, K. 2013. "What Is Social Exchange Theory?," <http://psychology.about.com/od/sindex/q/socialexchange.htm>).
- Chin, W. W. 2010. "Bootstrap Cross-Validation Indices for PLS Path Model Assessment," in *Handbook of Partial Least Squares: Concepts, Methods and Applications*, V. Esposito Vinzi, W.W. Chin, J. Henseler and H. Wang (eds.).
- Correa, T., Hinsley, A. W., and De Zúñiga, H. G. 2010. "Who Interacts on the Web?: The Intersection of Users' Personality and Social Media Use," *Computers in Human Behavior* (26:2), pp. 247-253.
- Cropanzano, R., and Mitchell, M. S. 2005. "Social Exchange Theory: An Interdisciplinary Review," *Journal of Management* (31:6), pp. 874-900.

- Dennison, G., Bourdage-Braun, S., and Chetuparambil, M. 2009. "Social Commerce Defined. White Paper." Research Triangle Park, NC.: IBM Systems Technology Group.
- Ellison, N. B., Steinfield, C., and Lampe, C. 2007. "The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites," *Journal of Computer-Mediated Communication* (12:4), pp. 1143-1168.
- Emerson, R. M. 1976. "Social Exchange Theory," *Annual Review of Sociology* (2), pp. 335-362.
- Erwin, B. A., Turk, C. L., Heimberg, R. G., Fresco, D. M., and Hantula, D. A. 2004. "The Internet: Home to a Severe Population of Individuals with Social Anxiety Disorder?," *J Anxiety Disord* (18:5), pp. 629-646.
- Fornell, C., and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research (JMR)* (18:1), pp. 39-50.
- Galbraith, P. W. 2010. "Akihabara: Conditioning a Public" Otaku" Image," *Mechademia* (5:1), pp. 210-230.
- Grieve, R., Kemp, N., Norris, K., and Padgett, C. R. 2017. "Push or Pull? Unpacking the Social Compensation Hypothesis of Internet Use in an Educational Context," *Computers & Education* (109), pp. 1-10.
- Hair, J. F., and Anderson, R. E. 2010. *Multivariate Data Analysis*. Prentice Hall.
- Hair Jr, J. F., and Hult, G. T. M. 2016. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, (2 ed.). Sage Publications.
- Hair Jr, J. F., Sarstedt, M., Ringle, C. M., and Gudergan, S. P. 2017. *Advanced Issues in Partial Least Squares Structural Equation Modeling*. SAGE Publications.
- Heeren, A., Mogoșe, C., Philippot, P., and McNally, R. J. 2015. "Attention Bias Modification for Social Anxiety: A Systematic Review and Meta-Analysis," *Clinical Psychology Review* (40), pp. 76-90.
- Indian, M., and Grieve, R. 2014. "When Facebook Is Easier Than Face-to-Face: Social Support Derived from Facebook in Socially Anxious Individuals," *Personality and Individual Differences* (59), pp. 102-106.
- Jang, K., Park, N., and Song, H. 2016. "Social Comparison on Facebook: Its Antecedents and Psychological Outcomes," *Computers in Human Behavior* (62), pp. 147-154.
- Kaplan, A. M., and Haenlein, M. 2010. "Users of the World, Unite! The Challenges and Opportunities of Social Media," *Business Horizons* (53:1), pp. 59-68.
- Koufaris, M. 2002. "Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior," *Information Systems Research* (13:2), pp. 205-223.
- Krause, N., and Markides, K. 1990. "Measuring Social Support among Older Adults," *International Journal of Aging & Human Development* (30:1), pp. 37-53.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., and Crawford, A. 2002. "Internet Paradox Revisited," *Journal of Social Issues* (58:1), pp. 49-74.

- Laghi, F., Schneider, B. H., Vitoroulis, I., Coplan, R. J., Baiocco, R., Amichai-Hamburger, Y., Hudek, N., Koszycki, D., Miller, S., and Flament, M. 2013. "Knowing When Not to Use the Internet: Shyness and Adolescents' on-Line and Off-Line Interactions with Friends," *Computers in Human Behavior* (29:1), pp. 51-57.
- Leary, M. R. 1983. "Social Anxiousness: The Construct and Its Measurement," *Journal of Personality Assessment* (47:1), pp. 66-75.
- Lee, B. W., and Stapinski, L. A. 2012. "Seeking Safety on the Internet: Relationship between Social Anxiety and Problematic Internet Use," *Journal of Anxiety Disorders* (26:1), pp. 197-205.
- Lenhart, A., Purcell, K., Smith, A., and Zickuhr, K. 2010. "Social Media and Young Adults: Social Media and Mobile Internet Use among Teens and Young Adults," Washington, DC.
- Leventhal, G. S., Gergen, K., Greenberg, M., and Willis, R. 1980. "Social Exchange: Advances in Theory and Research," *Social exchange: advances in theory and research*).
- Liang, T.-P., Ho, Y.-T., Li, Y.-W., and Turban, E. 2011. "What Drives Social Commerce: The Role of Social Support and Relationship Quality," *International Journal of Electronic Commerce* (16:2), pp. 69-90.
- Liang, T.-P., and Turban, E. 2011. "Introduction to the Special Issue Social Commerce: A Research Framework for Social Commerce," *International Journal of Electronic Commerce* (16:2), pp. 5-14.
- Liebowitz, M. R., Gorman, J. M., Fyer, A. J., and Klein, D. F. 1985. "Social Phobia: Review of a Neglected Anxiety Disorder," *Archives of general psychiatry* (42:7), pp. 729-736.
- Mühlberger, A., Wieser, M. J., and Pauli, P. 2008. "Visual Attention During Virtual Social Situations Depends on Social Anxiety," *CyberPsychology & Behavior* (11:4), pp. 425-430.
- Madell, D., and Muncer, S. 2006. "Internet Communication: An Activity That Appeals to Shy and Socially Phobic People?," *CyberPsychology & Behavior* (9:5), pp. 618-622.
- Maslow, A. H., Frager, R., Fadiman, J., McReynolds, C., and Cox, R. 1970. *Motivation and Personality*. Harper & Row New York.
- McCord, B., Rodebaugh, T. L., and Levinson, C. A. 2014. "Facebook: Social Uses and Anxiety," *Computers in Human Behavior* (34), pp. 23-27.
- Nadkarni, A., and Hofmann, S. G. 2012. "Why Do People Use Facebook?," *Personality and Individual Differences* (52:3), pp. 243-249.
- Ng, C. S.-P. 2013. "Intention to Purchase on Social Commerce Websites across Cultures: A Cross-Regional Study," *Information & Management* (50:8), pp. 609-620.
- Pierce, T. 2009. "Social Anxiety and Technology: Face-to-Face Communication Versus Technological Communication among Teens," *Computers in Human Behavior* (25:6), pp. 1367-1372.
- Poley, M. E. M., and Luo, S. 2012. "Social Compensation or Rich-Get-Richer? The Role of Social

- Competence in College Students' Use of the Internet to Find a Partner," *Computers in Human Behavior* (28:2), pp. 414-419.
- Prizant-Passal, S., Shechner, T., and Aderka, I. M. 2016. "Social Anxiety and Internet Use – a Meta-Analysis: What Do We Know? What Are We Missing?," *Computers in Human Behavior* (62), pp. 221-229.
- Rook, K. S. 1984. "The Negative Side of Social Interaction: Impact on Psychological Well-Being," *Journal of Personality and Social Psychology* (46:5), pp. 1097-1108.
- Ross, C., Orr, E. S., Sisic, M., Arseneault, J. M., Simmering, M. G., and Orr, R. R. 2009. "Personality and Motivations Associated with Facebook Use," *Computers in Human Behavior* (25:2), pp. 578-586.
- Schaefer, C., Coyne, J. C., and Lazarus, R. S. 1981. "The Health-Related Functions of Social Support," *Journal of behavioral medicine* (4:4), pp. 381-406.
- Selfhout, M. H. W., Branje, S. J. T., Delsing, M., Ter Bogt, T. F. M., and Meeus, W. H. J. 2009. "Different Types of Internet Use, Depression, and Social Anxiety: The Role of Perceived Friendship Quality," *Journal of Adolescence* (32:4), pp. 819-833.
- Shalom, J. G., Israeli, H., Markovitzky, O., and Lipsitz, J. D. 2015. "Social Anxiety and Physiological Arousal During Computer Mediated Vs. Face to Face Communication," *Computers in Human Behavior* (44), pp. 202-208.
- Smith, C. 2015. "By the Numbers: 200 Plus Amazing Facebook User Statistics (February 2015)." Retrieved 04/10, 2015, from <http://expandedramblings.com/index.php/by-the-numbers-17-amazing-facebook-stats/3/>
- Social Commerce Today, E. 2011. "Simple Definition of Social Commerce." Retrieved 3/3, 2013, from <http://socialcommercetoday.com/social-commerce-definition-word-cloud-definitive-definition-list/>
- Stein, M. B., and Stein, D. J. 2008. "Social Anxiety Disorder," *The Lancet* (371:9618), pp. 1115-1125.
- Steinfeld, C., Ellison, N. B., and Lampe, C. 2008. "Social Capital, Self-Esteem, and Use of Online Social Network Sites: A Longitudinal Analysis," *Journal of Applied Developmental Psychology* (29:6), pp. 434-445.
- Stevens, S. B., and Morris, T. L. 2007. "College Dating and Social Anxiety: Using the Internet as a Means of Connecting to Others," *CyberPsychology & Behavior* (10:5), pp. 680-688.
- Weidman, A. C., Fernandez, K. C., Levinson, C. A., Augustine, A. A., Larsen, R. J., and Rodebaugh, T. L. 2012. "Compensatory Internet Use among Individuals Higher in Social Anxiety and Its Implications for Well-Being," *Personality and Individual Differences* (53:3), pp. 191-195.
- Wieser, M. J., Pauli, P., Grosseibl, M., Molzow, I., and Mühlberger, A. 2010. "Virtual Social Interactions in Social Anxiety-the Impact of Sex, Gaze, and Interpersonal Distance," *CyberPsychology, Behavior & Social Networking* (13:5), pp. 547-554.

