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Factors affecting information sharing in social networking sites amongst university students

Application of the knowledge-sharing model to social networking sites

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Abstract

Purpose – Drawing upon the knowledge sharing model, the purpose of this paper is to identify personal and environmental antecedents to information sharing on social networking sites (SNSs) and examines the interaction effects between the two factors.

Design/methodology/approach – Data were collected via online survey with college students. Hierarchical multiple regressions were performed to test hypotheses and examine research questions.

Findings – With regard to environmental factors, the more users perceive their audience to be a collection of weak ties, the more likely they are to share information on SNSs, independent of the size of their networks. Personal factors such as information self-efficacy, positive social outcome expectations, and sharing enjoyment feelings were found to be significant predictors of sharing activities. In addition, a significant interaction effect was found such that the effects of social outcome expectations on sharing activities on SNSs are manifested to a greater extent when users perceive their audience as weak ties rather than strong ties.

Originality/value – This study extends the knowledge sharing model literature by applying it to the SNS context and advances SNS research by taking into consideration both environmental factors and personal factors and their interactions.

Keywords Social networking sites, Knowledge sharing model, Social cognitive theory, Tie of strength

Paper type Research paper

Introduction

Within the US users of social networking sites (SNSs) represent roughly 70 per cent of those online (Duggan *et al.*, 2015), underscoring the increasing role of SNSs as a mainstay of our daily media consumption. A benefit of SNSs is that users can quickly learn about important news stories, issues and events through their contacts as well as from official news entities. A recent Pew Research study, for instance, reported that about half of US online users get news from SNSs, which amounts to approximately 30 per cent of all US adults (Mitchell *et al.*, 2013). In addition SNSs are the second largest traffic sources for top news web sites and are increasingly approaching the level of search engines, the number one web traffic sources (McGee, 2014). These industry statistics suggest that SNSs have evolved from fundamental networking tools into a major source of news and information.

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One factor that may have contributed to this information environment is users' voluntary information sharing on SNSs. Generally SNSs provide sharing features, which promote the dissemination of ideas, opinions, reactions, interests, activities and other forms of user-generated content for other users to consume. SNS users, in so doing, enrich and contribute SNS content. Given the rapid growth in popularity of SNSs as an information source, users' motivations for information sharing on SNSs warrant further investigations.

A large number of studies on online information sharing have focused on electronic word-of-mouth with a primary emphasis on information about brands, products or services (King *et al.*, 2014). Literature on general information sharing including news and entertainment on SNSs has been limited. A few studies have investigated the antecedents of news sharing on SNSs and identified information seeking, socialising and status seeking as motivational antecedents (Lee and Ma, 2012). However, individual SNS users' motivation and sharing behaviours may also be defined and influenced by environmental factors (Bandura, 1989). These may include the size of social networks and the strength of ties among one's social networks. Environmental factors may vary across SNS users. Research examining the roles of both personal and environmental factors in information sharing on SNSs is scarce. To fill this gap the present study draws upon the knowledge-sharing model and its parent theory, social cognitive theory, which provides a tripartite model of personal and environmental factors and individual behaviour (Bandura, 1986).

The knowledge-sharing model has been utilised to elucidate sharing behaviours in contexts such as business organisations (Law and Ngai, 2008; Wah *et al.*, 2005) and virtual communities (Chiu *et al.*, 2006; Hsu *et al.*, 2007). Although the knowledge-sharing model provides a promising framework for information sharing behaviours on SNSs, it has been underutilised as a theoretical framework for studying information sharing activities in the context of SNSs. Information sharing is a highly contextual phenomenon (Talja and Hansen, 2006; Wilson, 2010). Motivational drivers thus vary depending on the context in which information sharing is to occur. Thus, recognising the differences between the organisational contexts and SNSs, the present study attempts to identify key factors explaining the variance of information sharing behaviours in the SNS context. In addition this study investigates the interaction effects of personal factors and environmental factors on information sharing on SNSs. This investigation will help improve understanding of the nature of information sharing behaviours and the types and characteristics of information shared on SNSs.

Literature review

The knowledge-sharing model in different contexts

User-generated content creation and dissemination on SNSs, in many ways, is analogous to knowledge sharing behaviour (Law and Ngai, 2008). For instance, knowledge sharing has been defined as a voluntary behaviour wherein an individual shares his or her acquired knowledge with others (Helmstadter, 2003). This process presumes social interactions between knowledge contributors and receivers, across a variety of contexts. Prior studies identified and highlighted the influence of different types of factors in contexts that include professional organisations (e.g. Cabrera *et al.*, 2006; Lin, 2007; Wah *et al.*, 2005) and physical (e.g. Wellman and Wortley, 1990) or virtual communities (e.g. Chiu *et al.*, 2006; Hsu *et al.*, 2007).

Existing knowledge sharing literature has identified both personal and environmental factors to knowledge sharing in organisational settings. A line of research focusing on

personal rewards/benefits as knowledge sharing drivers views knowledge sharing as a competitive advantage for an organisation (Cabrera and Cabrera, 2005). From this perspective knowledge is a valuable and strategic resource for companies (Miller and Shamsie, 1996) and shared knowledge among members contributes to increasing an organisation's assets. Commercial organisations thus seek to encourage and understand knowledge exchange and motivations in the sharing process. Within the professional sector, researchers have found that extrinsic motivators such as monetary incentive or promotion stimulated people to share their knowledge with others (Al-Busaidi *et al.*, 2010).

Adopting the concept of social capital, another line of studies has further identified environmental factors such as a norm of reciprocity and organisational climate (Bock *et al.*, 2005; Wah *et al.*, 2005). These studies view social capital as having structural and relational dimensions. For instance Wah *et al.* (2005) found that an organisational climate oriented towards open-mindedness facilitates knowledge sharing in addition to personal rewards. Bock *et al.* (2005) found that an organisational climate of perceived fairness and belongingness significantly influences intention to engage in knowledge sharing activities. Cabrera *et al.* (2006) suggest that a supportive work environment including emotional encouragement from supervisors and peers is a significant factor in predicting knowledge sharing behaviours in a large multinational corporation setting. This line of research has suggested that organisational cultures fostering trust and a norm of reciprocity would encourage knowledge sharing within organisations.

Information sharing in virtual communities tends to operate somewhat differently, given that it is often characterised by anonymity among users. In a typical knowledge sharing situation involving virtual communities, a knowledge seeker posts a question that requires domain-specific knowledge. Someone who possesses the relevant knowledge may reply and give an answer to the question without expectation of tangible benefits from the sharing behaviour. In many cases there is no personal connection between the information giver and receiver. Researchers have identified altruism as a more influential driver of knowledge sharing in virtual communities than extrinsic rewards (Chang and Chuang, 2011). Chang and Chuang (2011) found that prosocial motives (e.g. enjoyment from helping others) exert a stronger influence than concrete personal benefits on the quality (e.g. degree of helpfulness) and quantity (i.e. frequency) of information sharing activities among virtual community members.

Unlike professional organisations, however, SNS users do not work towards common organisational goals. In addition networks of SNS users are different from members of virtual communities, which are often based on relationships with anonymous strangers who share common interests. Some SNSs do, however, require their users' real world identity (Facebook, 2014). Networks of SNS users vary across users and tend to reflect existing real-life relationships (Boyd and Ellison, 2008). In the following section, drawing upon social cognitive theory, the current study identifies personal and environmental factors that can affect information sharing in SNS contexts.

Social cognitive theory and information sharing

Social cognitive theory, as proposed by Bandura (1986), provides a framework for understanding voluntary human behaviour. It has been widely applied to explain individuals' voluntary behaviours in various fields of research including marketing (e.g. Young *et al.*, 2005), management (e.g. Wood and Bandura, 1989), education (e.g. Zimmerman, 1989) and mass communication (e.g. Bandura, 2001). The basic premise of social cognitive theory is that individual behaviour, personal factors and environmental factors constantly influence and determine each other bidirectionally

(Bandura, 1986). A person's behaviour in a certain situation is developed or modified by his or her cognition and social environment. The behaviour and feedback received from that behaviour, in turn, shape that individual's cognition and determine the way in which he or she construes the environment and reacts to it. In other words social cognitive theory posits triadic reciprocal causation. However, this does not necessarily imply that the three constructs affect each other with equal strength (Bandura, 2001). It is assumed that the patterns of interaction between these factors may vary depending on the individual, the particular behaviour being examined and the specific context in which the behaviour occurs (Bandura, 1997).

A number of studies in knowledge management have revealed that personal factors such as individual motivation have a significant influence on voluntary information sharing (e.g. Cheung and Lee, 2007; Kankanhalli *et al.*, 2005; Wasko and Faraj, 2000).

Personal factors: self-efficacy and outcome expectations

In social cognitive theory personal factors can refer to cognitive, affective or biological properties that can affect an individual's perceptions and actions (Bandura, 2001). In particular researchers utilising social cognitive theory have focused on cognitive functioning in the knowledge sharing literature. Among personal factors, two key concepts have received prominent attention in social cognitive theory: self-efficacy and expected outcome.

Self-efficacy. Self-efficacy is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is not concerned with the skills one has, but with judgments of what one can do with whatever skills one possesses" (Bandura, 1986, p. 391). Bandura (1997) postulated that perceived self-efficacy influences individuals' decisions about what behaviours to undertake, the degree of effort they will exert in pursuit of adopted goals, and the level of behavioural goals they set for themselves. The stronger the perceived self-efficacy, the greater and the more persistent are individual efforts to perform the activity. Two types of self-efficacy have been commonly tested in the knowledge sharing literature: technology self-efficacy and information self-efficacy.

Technology self-efficacy refers to individuals' perceptions of their capabilities to use technology to accomplish a given task (Compeau and Higgins, 1995). This concept may be important in the context of information sharing using technology such as SNSs because individuals' doubts about their ability to use media technologies (e.g. social media platforms) can be a critical barrier to performing a desired behaviour. SNS users are fundamentally members of the general public who are utilising new media technology, which constantly adds new features. Jarvenpaa and Staples (2000) found that having adequate technical skills was a significant predictor of information sharing using collaborative electronic media. Lee and Ma (2012) also found that users' familiarity with various features of social media positively influences their news sharing intention in social media platforms. They speculated that prior social media experiences might enhance user confidence in their ability to use social media, and sharing behaviours might become routine and habitual as they become more self-efficacious.

Another relevant type of self-efficacy is information self-efficacy. Information self-efficacy refers to a personal belief about one's capabilities to share valuable information with others (Cabrera and Cabrera, 2002). These capabilities include perceived expertise in the subject matter, authoring knowledge content with suitable examples in the

sharing context and sharing personal knowledge in formal or informal interactions among individuals (Hsu *et al.*, 2007). Several empirical studies have reported a positive relationship between information self-efficacy beliefs and one's inclination to engage in information sharing. Kankanhalli *et al.* (2005) contended that perceived expertise boosts one's confidence in what they can do. This perception, in turn, inspires individuals to share knowledge in an organisational setting. Lu and Hsiao (2007) found that knowledge self-efficacy predicted bloggers' intention to continue to update their blogs. Similarly Cheung and Lee (2007) found a positive impact of knowledge self-efficacy on sharing intentions in virtual communities. Conversely, Lee *et al.* (2006) found that people are less likely to share their knowledge on a web-based discussion board if they think they lack expertise in the subject matter. Thus it is expected that one's perception of technology self-efficacy and information self-efficacy may be important factors influencing users' inclination to share information on SNSs. This leads to the following hypotheses:

H1. Perceived technology self-efficacy is positively associated with information sharing behaviours on SNSs.

H2. Perceived information self-efficacy is positively associated with information sharing behaviours on SNSs.

Positive outcome expectations. Another key personal factor identified in social cognitive theory is people's expectation of consequences from their own behaviour (Butler *et al.*, 2007). Outcome expectancy is often used to explain why people spend time and effort engaging in voluntary behaviours.

Bandura (1986) suggests that people are more likely to take a certain action when they believe that it will lead to positive and valued outcomes. According to Bandura (1997) outcome expectations are manifested in three major forms: physical effects that accompany the behaviour (e.g. pleasure, discomfort), social reactions evoked by the behaviour (e.g. social recognition, power), and self-evaluative reactions to one's own behaviour (e.g. self-satisfaction, a sense of pride). Previous research on information technology use investigated the relationship between expected benefits and individuals' behaviours, focusing on social reactions and self-evaluative outcomes. For instance several studies have found that extrinsic rewards (e.g. monetary incentives) encourage knowledge sharing behaviours among employees (Bock *et al.*, 2005; Gupta and Govindarajan, 2000). In the online setting including SNSs, however, intrinsic motivations, such as the desire for social recognition, may be an important driver of information sharing behaviours because few extrinsic rewards are given to information sharers. Empirical studies on online communities have supported this proposition. Wasko and Faraj's (2000) study found that the desire to build a reputation as an expert was a strong driver of knowledge contribution among users of web-based discussion forums. Ardichvili *et al.* (2003) also reported that users feel less hesitant about posting information on online forums if they perceive knowledge sharing as a means of earning professional reputations. We argue this proposition would hold true on SNSs that often involve consistent and authentic identities.

Along with social outcome expectations, sharing enjoyment may be a potential predictor of individuals' information sharing on SNSs as well. Research shows enjoyment from helping others to be a key initiator of knowledge sharing behaviour (Cheung and Lee, 2007). Kankanhalli *et al.* (2005) examined several motivators and inhibitors of knowledge contribution and reported that pleasure derived from helping

others prompted knowledge sharers' contributions to electronic knowledge repositories. Constant *et al.* (1996) explored knowledge sharing within weak-tie relationships and found information providers to be motivated by emotional benefits such as enjoyment of helping other people and enjoyment of solving challenging problems. They argue that people can improve self-esteem and self-respect by helping others, and thus, these intrinsic personal benefits may lead to altruistic social behaviours. Based on the literature we predict that individuals' expectations that sharing information will result in positive social reactions in their social network, along with sharing enjoyment, will motivate them to share information with other users on SNSs:

H3. Positive social outcome expectation is positively associated with information sharing behaviours on SNSs.

H4. Sharing enjoyment is positively associated with information sharing behaviours on SNSs.

Environmental factors: strength of social ties

People use SNSs to create new social relationships or maintain current relationships with other people, ranging from casual acquaintances and colleagues to close friends and family members (Ellison *et al.*, 2007). Scholars have classified interpersonal connections into strong (e.g. close friends, relatives) and weak ties (e.g. colleagues, acquaintances) based on the importance of relationships, duration, intimacy or frequency of contact (Granovetter, 1973). As SNSs become more popular, users incorporate both types of social ties in their social networks (Hampton *et al.*, 2011).

Tie strength may have a profound impact on an individual's usage patterns and information sharing likelihood on SNSs. Previous research suggests that individuals are more likely to share information online if they have strong and direct ties with their potential audience (Nov and Ye, 2008). In virtual communities Chiu *et al.* (2006) found that close and frequent interaction among members increases the quantity of their knowledge sharing. Ma *et al.* (2014) also found the stronger the social network tie, the higher intention to share news on SNSs.

SNS users may also assume that they intimately know the interests and needs of the people with whom they have strong ties. This familiarity may increase efforts to gather or create novel information that attracts the attention of those people. Unprecedented information that addresses the needs and interests of others may be viewed as worth sharing. Users' willingness to share content with others may be enhanced if they believe that they can provide such valuable information for their close "friends" on SNSs. Based on previous findings and arguments, this study examines perceived strength of social ties among users as an environmental factor that influences their engagement in information sharing activities. Therefore the following hypothesis is proposed:

H5. The perception users have of the strength of their own network ties is positively associated with information sharing behaviours on SNSs.

In addition to audience type such as the strength of ties, audience size has been found to affect sharing behaviours (Berger, 2014). Although little research has been done on the relationship between audience size and the frequency of information sharing, the notion of outcome expectations suggests that the more positive outcomes are perceived by individuals to be associated with a given action, the more inclined they will be to perform that action (Bandura, 1986). The total number of one's online "friends" may be directly related to the size of the audience for the information

posted, and thus, it may influence a person's perception of the level of possible positive outcomes produced by information sharing activities. This speculation leads us to the following hypothesis:

H6. The number of friends on SNSs is positively associated with information sharing behaviours.

Interaction effects between personal factors and environmental factors

A basic premise of social cognitive theory suggests that an individual's voluntary behaviour, along with both personal and environmental factors, influence each other. It is plausible and realistic that interaction effects between personal factors and environmental factors can come into play in affecting information sharing on SNSs. For example the size of a network may or may not promote information sharing behaviours on SNSs (Berger, 2014). When the size of social networks and information self-efficacy are considered together, large networks and information self-efficacy may have a synergy on information sharing behaviours. Similarly the size of social networks and sharing enjoyment may induce synergy as well. The existing empirical evidence is not sufficient to make specific predictions on the interaction effects of personal and environmental factors. Thus we pose the following research question:

RQ1. Are interaction effects between personal factors and environmental factors manifested in information sharing behaviours on SNSs? If so, which pairs of interaction effects are significant in explaining information sharing behaviours?

Figure 1 represents the proposed model of our hypotheses.

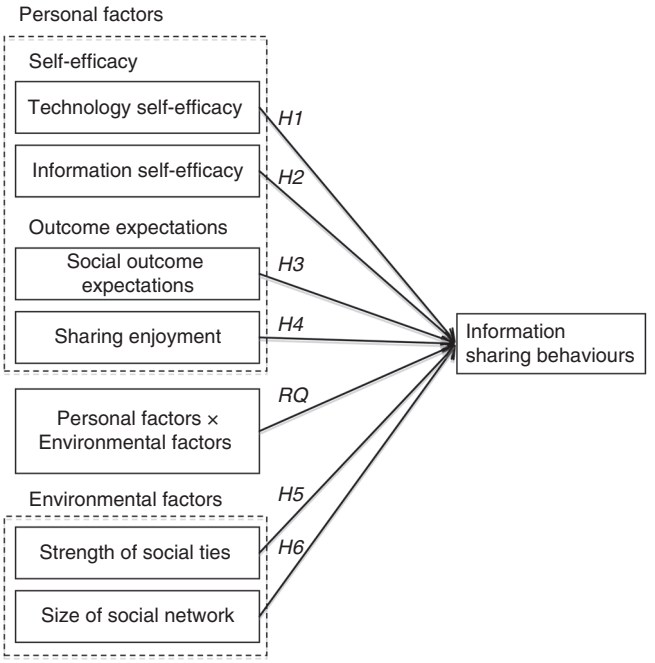

Figure 1.
Hypothesised model of information sharing behaviour on SNSs

Method

Data were collected via an online survey to test the hypotheses and research question. A self-administered online survey was conducted with university students. Students in three large introductory communication courses at a major public university in the southeast US received survey invitations. Respondents participated in exchange for extra credit. According to Calder *et al.* (1981) a homogeneous sample such as university students is acceptable for theory application research because it reduces the likelihood of extraneous variables (e.g. age, education or income) having an impact on the results. In addition the use of university students increases the relevance of this study to the young active SNS user group. This young adult demographic represents the most active user segment of SNSs among all age groups (Duggan *et al.*, 2015).

Data analysis was limited to those who indicated they have used a SNS such as Facebook, Twitter, Google+, Instagram or LinkedIn. At the beginning of the survey the definition of SNS was presented and participants were asked to select all the SNSs that they have used in the past three months. Those who had not used any SNSs were excluded from the analysis. Before measuring key variables we asked respondents to choose the SNS they use the most and answer the questions based on their experiences with that SNS.

Questionnaire construction and key measures

Once participants qualified for the study, they were asked about the frequency of their information sharing behaviours along with a series of measures of independent variables, such as perceptions of technology self-efficacy, information self-efficacy, positive social outcome expectations and sharing enjoyment. Finally, respondents were asked general questions concerning SNS usage (e.g. frequency and time spent on the SNS per day) and demographic characteristics. The key measures are presented in Table I.

We operationalised the key dependent variable, information sharing activities, on SNS as follows: posting personal opinions of interest on SNS, uploading materials or content (e.g. video clips, photos, links to news webpages) from other web sites or those created by the user, making comments about the material or content users uploaded, and sharing information that users learned offline or online. Information sharing behaviour was measured by the frequency of the self-reported behaviour. We used the closed-ended question to reduce respondent burden that may have been caused in the case of an open-ended question. Frequency was measured by asking "How often do you do each of the following activities?" with six options: several times a day, about once a day, two or three times a week, once a week, two or three times a month, less than once a month and never. We computed the frequency of sharing activities per month and averaged them for all four information sharing behaviours.

To measure technology self-efficacy, four items on a seven-point Likert scale developed by Eastin and LaRose (2000) were averaged (Table I). An information self-efficacy variable was created by averaging four seven-point Likert scale items that were adopted from Hsu *et al.* (2007).

Three seven-point Likert scale items for measuring positive social outcome expectations were also adopted from Hsu *et al.* (2007). Sharing enjoyment is defined as the self-satisfaction from helping others. Three seven-point Likert items were adopted from Kankanhalli *et al.* (2005) to measure the sharing enjoyment variable.

The strength of social ties on SNSs is defined as the perceived closeness of the relationships with potential audience members on an SNS. Perceived closeness was measured by asking, "How would you describe the audience that you expect to pay

Concepts	Measures	Sources
Frequency of information sharing behaviour (several times a day/ about once a day/2-3 times a week/once a week/less than a once a month/ never)	Posting personal opinions of interest on the SNS	Created by authors
	Uploading materials or contents (e.g. video clips, links to news webpages) from other web sites or that you created	
	Providing comments for the materials or contents you uploaded (e.g. video clips, links to news web sites, photos)	
	Sharing information that you learned online or offline	
Technology self-efficacy (7-point Likert scale)	I feel confident understanding terms/words that are needed to use this SNS	Eastin and LaRose (2000)
	I feel confident in my ability to figure out what to do when a feature does not work (e.g. uploading a picture, tagging links)	
	I feel confident learning advanced features in this SNS	
	I feel confident turning to an online discussion group on the internet	
Information self-efficacy (7-point Likert scale)	I feel confident providing my experiences, insights or expertise as an example for others	Hsu *et al.* (2007)
	I feel confident providing my experiences, insights or expertise by engaging in dialogue with others	
	I feel confident providing my ideas and perspectives to others through participating in discussions	
	I feel confident answering questions, giving advice or providing examples to questions from others	
Positive social outcome expectations (7-point Likert scale)	If I share information, content or knowledge with other friends on the SNS, I think I will gain more recognition and respect	Hsu *et al.* (2007)
	If I share information, content or knowledge with other friends on the SNS, I think I will be seen as trustworthy	
	If I share information, content or knowledge with other friends on the SNS, I think the relationship between us will be strengthened	
Sharing enjoyment (7-point Likert scale)	I enjoy sharing information, content or knowledge I have with others on a social networking site	Kankanhalli *et al.* (2005)
	I enjoy helping others by sharing information, content or knowledge I have on a social networking site	
	Sharing information, content or knowledge with others on a social networking site gives me pleasure	
Strength of social ties (7-point scale)	"How would you describe the audience that you expect to pay attention to your posted information, content or knowledge you share on the SNS you use the most on the following 7-point scale?" Acquaintance→close friends	Created by authors

Table I.
Key variable measures

(*continued*)

Concepts	Measures	Sources
Size of social network (open-ended)	The sum of the number of one's friends on SNS	Created by authors
Amount of time spent on SNS	On average, how much time do you spend on the SNS a day? Please type the total amount of minutes you spend on the site in a numerical format (e.g. 45)	Created by authors
Frequency of visiting SNS	On average, how many times do you check the SNS per day? Please type the total number in a numerical format (e.g. 5)	

Table I.

attention to your posted information, content or knowledge you share on the SNS you use the most on the following seven-point scale? Acquaintances (1) through close friends (7)". The size of social networks was measured by the number of contacts the user has on the SNS. As for SNS use in general, the frequency of use and the average time spent on the SNS per day were asked in the open-ended questions.

Results

Participant characteristics

The qualified sample included 308 participants in the analysis. Most (68 per cent) were female. The average age was 19.5 (SD = 1.39), ranging from 17 to 27. The sample consisted of 68 per cent white Non-Hispanic, 6 per cent African-American, 20 per cent Hispanic, and 3 per cent Asian-American.

Regarding the general use of SNSs, 96 per cent of the sample used Facebook, 46 per cent used Twitter, 23 per cent used Google+, 16 per cent used LinkedIn and 4 per cent used MySpace. A large majority (90 per cent) of our sample selected Facebook as the most used SNS, while 6 per cent chose Twitter as their main SNS. Our respondents have an average of 589 contacts on their main SNS. On average they spent approximately 1.5 hours on the SNS per day and checked the SNS 11 times a day. Participants reported that they do information sharing activities on their main SNS 12 times a month on average, whereas only seven participants reported that they have never participated in any information sharing activities that are listed in the questionnaire. Most (73 per cent) of our sample reported they first joined their main SNS more than two years ago.

Descriptive statistics and a correlation matrix among key measures are presented in Table II. Inter-item reliability tests were performed by using Cronbach's α. The results of all the composite measures were higher than the conventional cut-off level (0.70) (Hair *et al.*, 2005).

Hypotheses testing

A hierarchical regression was conducted to test the six hypotheses. As with many studies using hierarchical regression analysis, the dependent variable of this study may be influenced by many predictors, which may lead to spurious results. We employed hierarchical regression to partition the explained variance by an order of independent variables. There are several principles underlying the hierarchical order for entry (Field *et al.*, 2012). We used known factors from previous research as a starting point. We used demographics, SNS uses, environmental factors and personal factors in order. We entered the computed frequency of information sharing behaviour

Table II.
Descriptive statistics for key measures

	1	2	3	4	5	6	7	8	9
1. Information sharing behaviour	1								
2. No. of friends	−0.003	1							
3. Time spent	0.216**	0.164**	1						
4. Usage frequency	0.138**	0.207**	0.320**	1					
5. Strength of tie	−0.055	−0.065	0.149**	−0.060	1				
6. Technology self-efficacy	0.162**	0.114*	0.183**	0.091	0.148**	1			
7. Information self-efficacy	0.270**	0.085	0.113*	0.078	0.174**	0.629**	1		
8. Social outcome expectation	0.265**	0.074	0.205**	0.112*	0.073	0.275**	0.346**	1	
9. Sharing enjoyment	0.314**	0.110*	0.282**	0.143**	0.104	0.458**	0.534**	0.502**	1
Mean	12.12	591.24	85.31	10.86	5.26	5.28	5.43	4.05	5.02
SD	13.15	455.83	69.39	17.75	1.21	1.19	1.08	1.25	1.12
Cronbach's α	0.90	na	na	na	na	0.88	0.95	0.91	0.94

Notes: $n = 308$. * < 0.05; ** < 0.01

per month as the dependent variable in the model. The previous literature suggests that the heavy use of media is one of the characteristics of opinion leaders who are more likely to articulate and share their opinions with peers (Katz and Lazarsfeld, 1955). Thus we examined the influence of key predictors on information sharing behaviour after controlling for the heavy use of SNSs. Regarding the effects of demographic characteristics on information sharing behaviours, previous studies have reported mixed results. For example Mogotsi *et al.* (2011) found no significant relationship between demographic factors and knowledge sharing behaviour. However, some studies have reported that there is a difference in information sharing behaviour between different age and gender groups (Lin, 2006). Given these conflicting findings, two demographic variables (age and gender) were also employed as control variables.

We controlled factors regarding SNS use (e.g. the average time spent on the SNS and the frequency of use) and demographic information in the first block of the model. We entered environmental factors, such as the perceived strength of network ties (*H5*) and the size of social networks (*H6*) in the second block. Finally, we entered four personal motivators (*H1-H4*) for information sharing behaviour in the third block to predict the variance of information sharing behaviour.

We performed the model comparison test to examine whether each hierarchical model contributes to the explained variance of information sharing behaviour. As presented in Table III, the hierarchical regression results revealed that the three blocks of predictors significantly explained the variance of information sharing behaviour.

As for the first model, the four predictors regarding demographic characteristics and the amount of SNS use (age, gender, the average time spent and usage frequency) significantly explained 6.0 per cent of information sharing behaviour ($R^2 = 0.060, F = 4.80$, df1 = 4, df2 = 299, $p = 0.001$). The two environmental factors (perceived strength of ties and the size of social networks) did not significantly explain the additional variance of information sharing behaviour after controlling for the amount of SNS use and demographic characteristics ($\Delta R^2 = 0.012$, df1 = 6, df2 = 297, $p = 0.001$). In the third model four intrinsic motivations (technology self-efficacy, information self-efficacy, social outcome expectations and sharing enjoyment) significantly explained information sharing behaviour after controlling for the influence of SNS use, demographic characteristics and perceived social environment ($\Delta R^2 = 0.103$, df1 = 4, df2 = 293, $p = 0.000$).

The regression coefficient for each predictor was examined to test the six hypotheses. Regarding self-efficacy factors, *H1* predicted that perceived technology self-efficacy positively influences information sharing behaviours. The regression results showed that technology self-efficacy did not significantly influence information sharing behaviours on SNSs ($\beta = -0.075$, $p > 0.05$). Thus *H1* was not supported. *H2* predicted the positive influence of information self-efficacy on information sharing behaviours. *H2* was supported in the regression results ($\beta = 0.166$, $p < 0.05$). The results suggest that SNS users who are more confident in giving their opinions are more likely to share information on SNSs.

H3 predicted that social outcome expectations representing the desire to be socially recognised and respected among peers positively influence information sharing behaviours. As hypothesised, the expected social outcome was found to be positively related to information sharing behaviours ($\beta = 0.151$, $p < 0.05$). Thus *H3* was supported. *H4* predicted the positive relationship between sharing enjoyment and information sharing behaviours. The regression coefficient of sharing enjoyment was significant in explaining information sharing behaviours ($\beta = 0.145, p < 0.05$). Thus *H4* was also supported.

		B	*β*	*p*
Model 1	(Constant)	17.132		0.131
	Age	−0.605	−0.064	0.266
	Gender	2.083	0.073	0.200
	Time spent	0.032	0.169	0.005
	Usage frequency	0.052	0.070	0.239
Model summary: $R^2 = 0.060$, $F = 4.80$, df1 = 4, df2 = 299, $p < 0.01$				
Model 2	(Constant)	22.776		0.054
	Age	−0.589	−0.062	0.279
	Gender	2.418	0.085	0.141
	Time spent	0.037	0.194	0.002
	Usage frequency	0.050	0.066	0.271
	Number of friends	−0.002	−0.056	0.338
	Strength of tie	−1.128	−0.102	0.074
Model summary: $R^2 = 0.073$, $F = 3.88$, df1 = 6, df2 = 297, $p < 0.01$				
Model comparison: $\Delta R^2 = 0.012$, $\Delta F = 1.96$, df1 = 2, df2 = 297, $p > 0.05$				
Model 3	(Constant)	11.818		0.313
	Age	−0.898	−0.094	0.088
	Gender	1.993	0.070	0.210
	Time spent	0.025	0.130	0.033
	Usage frequency	0.033	0.044	0.444
	Number of friends	−0.002	−0.076	0.172
	Strength of tie	−1.487	−0.135	0.014
	Technology self-efficacy	−0.828	−0.075	0.282
	Information self-efficacy	1.958	0.166	0.024
	Social outcome expectation	1.593	0.151	0.019
	Sharing enjoyment	1.703	0.145	0.046
Model summary: $R^2 = 0.175$, $F = 6.23$, df1 = 10, df2 = 293, $p < 0.01$				
Model comparison: $\Delta R^2 = 0.103$, $\Delta F = 9.11$, df1 = 4, df2 = 293, $p < 0.01$				

Table III.
Hierarchical regression for information sharing behaviours

The influence of environmental factors was hypothesised in *H5* and *H6*. *H5* predicted that the more users perceive their ties to their SNS audience as strong, the more likely they are to share information independent of the size of their networks on SNSs. Unexpectedly, the results indicate the opposite of *H5* holds true ($\beta = -0.14$, $p < 0.05$). Therefore *H5* was not supported. *H6* predicted the positive relationship between the number of SNS friends and information sharing behaviours. The results indicated that the size of one's social network was not significantly related to information sharing behaviours ($\beta = -0.08$, $p > 0.05$). Thus *H6* was not supported.

To examine interaction effects of personal factors and environmental factors on sharing behaviours, we created eight interaction terms of personal and environmental factors that were theoretically plausible: 2(strengths of ties and size of social networks) × 4 (technology self-efficacy, information self-efficacy, social outcome expectations and sharing enjoyment). We used the forward selection method to find the best additional sets of predictors in addition to our hypothesised model. As a result only the interaction effect between the strength of network ties and social outcome expectations was found to be statistically significant ($\beta = -0.126$, $p < 0.05$). We conducted a simple slope analysis to further interpret the meaning of this significant

interaction term (Cohen *et al.*, 2003). As Figure 2 shows, this finding suggests that when information sharers perceivetheir information receivers as weakly tied to them, the impact of positive social outcome expectations on the frequency of information sharing tends to increase, whereas the effect of positive social outcome expectations was not manifest for those who perceive their information receivers as closely tied.

Summary and discussion

The findings of our study indicate that personal and environmental factors are significant predictors of information sharing behaviours on SNSs while users' expectations of positive social outcomes and their perceived strength of network ties have a significant synergistic effect on sharing activities on SNSs.

First, this study identified two personal factors – perceived self-efficacy and intrinsic motivations – as predictors of sharing behaviours on SNSs. Among two self-efficacy factors, information self-efficacy emerged as a strong determinant of information sharing behaviours. This finding suggests that to stimulate writing and discussion about an issue via SNSs, users need to feel knowledgeable and competent with domain specific knowledge. Technology self-efficacy was not a significant predictor of sharing activities on SNSs in this study. This result may be due to the characteristics of the university student sample. As SNSs are commonly used by university students, technological proficiency might not be a cause of concern in sharing activities on SNSs.

The results also indicate that two intrinsic motivational factors – expectations of positive social outcomes and sharing enjoyment – are significant factors in determining the proclivity to share information on SNSs. These findings suggest the motivation to seek social recognition and strengthen relationships among social networks leads to more frequent sharing activities. The results also show that intrinsic rewards such as self-esteem or self-respect enhanced by altruistic efforts may encourage information sharing activities on SNSs. Regarding personal factors, the findings suggest that the ability factor (e.g. information self-efficacy) as well as the motivational factors (e.g. positive social outcome expectations and positive self-evaluation) may be important determinants of information sharing on SNSs.

Regarding environmental factors, the present study examined the impact of the size of social networks and the strength of ties on sharing frequency. The size of social

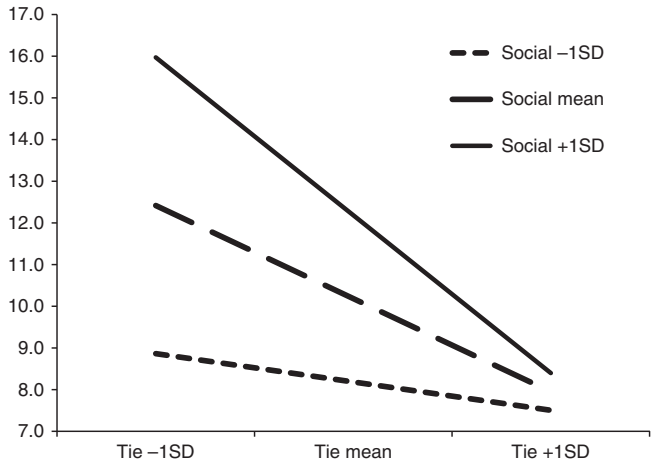

Figure 2.
Interaction effects of tie strength and social outcome expectation on information sharing frequency

networks was not found to be a significant predictor of sharing activities on SNSs. Users who have a larger number of contacts do not necessarily like sharing information on SNSs. Likewise users who tend to share a lot on SNSs do not necessarily have a large number of contacts. We speculate that audience size might moderate or boost information sharing depending on the type of information. A large audience may restrain sharing activities in the case of controversial issues whereas it may encourage sharing in the case of information that is innocuous (Berger, 2014). On the other hand, tie strength turned out to be a significant predictor of sharing activities. However, the direction was found to be opposite to the hypothesis. Our results indicate that the more users perceive their ties to their SNS audience to be weak, the more likely they are to share information, independent of the size of their social networks on SNSs. Research has shown that a major function of social media is often to form weak ties and interact with those people, rather than to reinforce strong tie relationships (Boyd and Ellison, 2008). The findings of this study support the argument that weak ties are better suited for disseminating new information or ideas compared to strong ties (Granovetter, 1973). Given our finding that SNS users are more likely to share information when they are confident the information will be beneficial to their networks, this additional result, in hindsight, is not surprising. People with strong tie relationships may be more likely to share the same "likes" and use the same information sources because strong ties tend to be homogeneous (Campbell *et al.*, 1986); therefore it is the weak ties in networks that provide the best opportunity to disseminate novel information. SNS users may be more inclined to use other means of communication such as telephones, face-to-face interactions or e-mail when they share information with close friends or family.

The present study also examined the interaction effects of personal factors and environmental factors on sharing behaviours. The interaction effect between the strength of ties and social outcome expectations was found to be statistically significant. An analysis of the slope test indicates that the effects of social outcome expectations on sharing activities on SNSs are manifested to a greater extent when users perceive their ties to contacts on SNS as weak rather than strong. When SNS users perceive that their audience tends to consist of people with whom they have weak ties, the beliefs that their sharing behaviour results in positive social outcomes are more likely to induce information sharing. These findings suggest that when one's social network mainly consists of acquaintances rather than family and close friends, intrinsic motivations such as gaining social recognition and trust become more powerful predictors of sharing activities on SNSs.

From the results of this study, we can speculate about the types of information that have a greater likelihood of being shared on SNSs. For example our findings on network tie strength suggest that SNS users are more likely to share information when they perceive their ties to their online audience to mainly be weak. Good feelings associated with sharing and personal social benefits are also found to be the key motivational factors for individuals to share information. Arguably, information most likely to be shared on SNSs may, therefore, be universally appealing to a broader audience with different tastes. SNS users may be more likely to share informative and useful content that enables them to receive a greater level of positive social rewards from their network. In addition entertainment-oriented content that is enjoyable to both the sharer themselves and receivers may have a better chance to be shared on SNSs.

This study has a few practical implications. Given that higher levels of information self-efficacy lead to increased information sharing on SNSs, information sharing should flourish in an atmosphere where insightful and exclusive information about specific

issues are made available to users. Thus users should be given preliminary exposure to information on relevant new goods and services ahead of the market, all of which can be impactful to friends and acquaintances who comprise the bulk of these users' online social network (Fuggetta, 2012). In addition special events and promotions could also be held for these individuals to ensure they are made privy to exclusive content.

Another implication of our findings is that information sharing is likely to occur if users receive recognition for their contributions. This can take the form of a thank you note or e-mail from a company's CEO (Fuggetta, 2012). It may allow them to feel that their opinions, reactions and ideas are valued by a desirable organisation.

Limitations and future research

The study utilised an 18-24-year-old university student convenience sample in the southeast USA. This poses potential limitations with respect to the representativeness of the sample and the generalisability of the findings, since university students' information sharing orientations may not reflect those of the general population. Future studies with other groups of SNS users such as non-student samples across different regions can be conducted to see if this model holds true for other populations of SNS users.

Another limitation of our study is the skewed gender distribution of the sample. Our female-skewed sample might influence the results although we controlled gender for sharing activities. We also used self-report measures for the frequency of sharing activities. Future research may need to employ actual sharing data on SNSs to validate our findings. Despite the limitations of the study, our findings do extend the body of work on information sharing in the examination of the relationship between personal factors, environmental factors and information sharing behaviour on SNSs.

The findings of our study raise a few important issues that need to be explored in future research. This study found that the more users perceive their audience as consisting of those to whom they have weak ties, the more likely they are to share information. However, acquaintances may include many different types of audiences on SNSs. As such, the concepts of acquaintances and weak ties need to be explored in future research.

This study examined the effects of positive social outcome expectations on information sharing behaviours only. Nevertheless, there could be negative outcomes from information sharing, such as regret, embarrassment, shame or the negative reactions of others to shared information. It may be interesting to explore how users' concerns about these negative social outcomes influence their information sharing activities. Last, future studies can explore message factors such as the nature and sensitivity of information on SNSs that may inhibit users' willingness to disseminate information *vis-à-vis* other online forums.

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