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**A MULTI-THEORETICAL APPROACH TOWARDS
UNDERSTANDING NEWS SHARING IN SOCIAL MEDIA**

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WEE KIM WEE SCHOOL OF COMMUNICATION AND INFORMATION

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Wee Kim Wee School of Communication and Information

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ABSTRACT

News delivered by a variety of media channels can impact civic agenda, public opinion, and the framing of reality in people's life. In recent years, social media is becoming the top outlet for people to access news stories that are shared by individual users. Given the significance of news flow in social media, it is important to know what factors may influence users' news sharing in the social media context.

Specifically, the two research objectives of the present research are as follows:

1) drawing from the literature on gratification research, this study attempts to identify what motivational factors drive users to share news in social media; 2) extending the uses and gratifications theory by identifying influential factors from diffusion of innovations theory, this research provides insights on how news attributes, opinion leadership, and diffusion networks may impact news sharing in social media. To achieve the research objectives, a conceptual model was proposed on the basis of the two theories. In particular, the entire research is divided into two interrelated studies.

In Study 1, hierarchical regression was employed to analyze the self-reported data collected from 318 respondents. Several interesting findings were revealed from the results. In terms of perceived gratifications, socializing was the strongest motivation in predicting news sharing, followed by status seeking and information learning. From the perspective of diffusion of innovations theory, it was found that opinion leadership, tie strength, and news liking/relevance, were significantly associated with users' news sharing in social media. The findings demonstrated that people's experiences with online news have been transformed from a personal activity to an interpersonal one using social media.

While the use of subjective data to measure motivations from the uses and gratifications perspective is appropriate, there are concerns that the subjective data may not accurately capture the network environmental factors derived from diffusion of innovations theory. To complement the data collected via the survey which focuses on individuals' characteristics and perceptions, the second study was conducted through analyzing secondary data harvested from social media platforms. Specifically, Twitter was selected as a benchmarking platform to provide insights on general information sharing and the network structures that evolve from online sharing behavior. Digg was selected as a news platform to examine users' news sharing in social media. Social network analysis was applied to analyze the secondary data. It was revealed that influential factors underlying general information sharing and news sharing were different. Furthermore, Study 2 identified that opinion leadership, tie strength, and news liking can significantly impact users' news sharing in social media.

Collectively, this research shows that gratification factors (including socializing, status seeking, and information learning), opinion leadership, tie strength, and news attributes can significantly influence users' news sharing in social media. For researchers, the present research provides a theoretical framework to advance the understanding of key factors that contribute to news sharing in social media. In addition, the hybrid approach combining social network analysis with statistical tests in the present research provides an innovative way to investigate the influence of social network in social media. For practitioners, the findings will shed light on enhancing users' active participation and contribution as well as improving the performance of business agencies (e.g., public relation, virtual marketing) in social media.

CHAPTER ONE INTRODUCTION

Background

“If searching for news was the most important development of the last decade, sharing news may be among the most important of the next.” (Olmstead, Mitchell, & Rosenstiel, 2011, p. 10)

According to a recent study about social media and news (Pew Research Centre, 2014), social media has become the top outlet for people to access news stories originally published in popular news websites. Internet users have experience in participating in creating or posting news stories, leaving comments, and disseminating news stories through social media sites. Specifically, they had performed at least one of the following activities: 50% have shared a news story in social media; 46% have discussed a news issue or relevant event in social media; 14% have posted photos they took of a news event to social media platforms; 12% have posted video they took of a news event. All told, social media has been increasingly utilized to gather and share news stories from popular news websites and individuals (Chen, 2011).

News sharing in social media has been increasingly gaining momentum. In social media platforms, a piece of news can be distributed across societies and discussed by people around the world within minutes. Take the recent Ukraine crisis for example (Stern, 2014). News of the protests spread quickly through social media platforms such as Twitter and Facebook. Thousands of photos and videos of the protests were posted and this immediately attracted attention around the world. These social media platforms turned out to play an important role in organizing and supporting these protests in Ukraine. This demonstrates that social media significantly influence news production and dissemination.

News flow in social media may exert significant influence on what should be given attention, and further impact individuals' beliefs, attitudes, behavior in aspects of social, economic and political life. News stories processed by individuals have been found to influence people's perceptions of reality in daily life (McCombs & Reynolds, 2009). For instance, Hester and Gibson (2003) found that news media's emphasis on negative economic news could result in serious impact on economic performance and expectation. As social media is becoming the main source for individuals' to process news stories (Purcell, et al., 2010), it is important to know what factors may influence

such news sharing behavior. In addition, as news content shared by active users may contribute to the growth of social media, understanding people's motivations underlying their behavior has the potential to improve the design and development of social media platforms. Further, understanding factors influencing news sharing in social media may benefit news agencies and public relations organizations, helping them to enlarge the scope of news diffusion for their promotional efforts.

Despite the phenomenal growth and significance of news sharing in social media, little empirical research has investigated what factors motivate individual users to share news stories in the context of social media. Among the few studies, Hanson and Haridakis (2008) investigated individuals' motives of news sharing in social media context. However, this study explored only video news sharing in a particular social media platform (i.e., YouTube), which makes validity of the findings problematic. Chen (2011) explored the relationship between perceived gratification and active Twitter users, and found that the need for connecting with others was associated with the frequency of informational content sharing (e.g., news stories, interpersonal messages). However, this research focused only on the gratification of connection and ignored other potential gratifications. In other words, motivations underlying people's news sharing behavior in social media have not been well documented in the literature.

While few studies have focused on news sharing in the social media context, prior research has instead explored individuals' news sharing behavior in traditional media (e.g., face-to-face communication, newspaper, television), aiming to reveal how the news reached the public and spread among individuals, and how quickly such diffusion took place (e.g., Gantz & Trenholm, 1979; C. Hsu & Lin, 2008). These studies mainly focusing on headline news stories (e.g., the assassination of a U.S. president, the *Challenger* disaster), attempted to reveal the role of different channels (mass media versus interpersonal channel) in spreading the news (Greenberg, 1964; Mayer et al., 1990). However, prior studies of news sharing mainly concentrated on revealing *how* major news stories are shared through mass media and interpersonal communication channels. Knowledge concerning *why* individuals share news stories has not been well studied. Hence, the present research aims to reveal factors underlying people's news sharing online from multiple perspectives, including

psychological motivations, news characteristics, opinion leadership as well as the impact of the online social environment.

Research on Uses and Gratifications

In order to explore individuals' motivational factors underlying news sharing behavior, the present research adopts the uses and gratifications theory as the theoretical basis. The uses and gratifications theory attempts to explain what social and psychological needs motivate audiences to select particular media channels and content choices (Diddi & LaRose, 2006; Lin, 2002; Rubin & Perse, 1987; Ruggiero, 2000). This theory explores individuals' media behavior from a user-oriented perspective in which it is presumed that media audiences are goal-directed and purposefully attempting to achieve those goals by using specific media channels and content (Armstrong & McAdams, 2009; Hanson & Haridakis, 2008; Rubin & Perse, 1987).

Prior studies have provided some explanations regarding why people discuss news events in the face-to-face communication context from a uses and gratifications perspective. In the study on news dissemination of the attempted assassination of George Wallace, Fink and Noell (1975) found that the need for reducing anxiety motivated individuals to disseminate news. Gantz (1983) suggested that reducing dissonance was one of the reasons for individuals to diffuse news events. Further, Gantz and Trenholm (1979) suggested that people disseminated news events through interpersonal channels in order to 1) establish social status, 2) satisfy informational and interest needs, 3) express affect and 4) initiate social contact. It should be noted that most of these findings were based on the context of traditional media.

With regard to sharing behavior in social media, previous studies have also identified gratification factors that are associated with informational content sharing, which is more general than news sharing. Chiu, Hsu, and Wang (2006) found that social interaction, reciprocity, identifications were related to knowledge sharing behavior in virtual communities. Lee et al. (2010) revealed that users' sharing of mobile media content was an attempt to seek for entertainment, information discovery, socialization, among other gratifications. Hsu and Lin (2008) suggested that the motivations for creating and sharing content in blog space may include expected relationships, reputation, and community identification. In addition, perceived

gratifications of information learning, enjoyment, socializing, and status seeking have been identified to significantly influence people's usage of social media (Dunne, Lawlor, & Rowley, 2010; N. Park, Kee, & Valenzuela, 2009).

Although these studies do not investigate the phenomenon of news sharing in social media, they demonstrate that the uses and gratifications theory is appropriate in the context of the online environment and shows the theory's potential explanatory ability in predicting individuals' sharing behavior.

Research on Diffusion of Innovations

Aside from the potential gratifications driving people to share news in social media, others factors, such as news characteristics, individual impact, and diffusion network factors, also play a role in influencing people's news sharing. Yet the role and importance of informational content and the social environment are not well explained in the uses and gratifications theory (Ruggiero, 2000; Wolling, 2009).

Here, a complementary line of inquiry is the diffusion of innovations theory which provides a systematic explanation of how innovation is communicated through certain channels over time, and then evaluated, adopted or rejected among members of a social system (Rogers, 2003). The innovation can be an idea, practice, or object that is perceived as relatively new by individuals (Rogers, 2003). Specifically, news, in which new information dwells, is also regarded as an innovation (Chatman, 1986; Rogers, 2003). Further, news itself is characterized to be timely and novel (Sundar, 1999), which is consistent with the criteria of innovation. Also, news is considered as a social commodity that is produced for people to adopt and consume (Shoemaker, 2006). Collectively, news can be considered a product which can be disseminated among people. Examining the process of dissemination is within scope of the diffusion of innovations theory.

Fundamentally, the diffusion of innovations theory explores the diffusion process on the basis of innovation attributes, opinion leadership, and characteristics of diffusion networks (Rogers, 2003; Wejnert, 2002). Innovations are disseminated through networks whereby individuals are interconnected with each other (Rogers, 2003). Similarly, in social media, news stories are shared by users who connect with each other. In the news diffusion or sharing process, influential factors, such as news attributes, users' personal influence, and characteristics of news diffusion networks,

should also impact people's news sharing behavior. These factors will be discussed as follows.

First, the news itself may exert influence on users' sharing behavior, for it is the informational vector that directly interacts with users (Lerman, 2007). In a related vein of research, several studies have also identified the influence of attributes of media content on individuals' media behavior. For instance, credibility of media content was found to be associated with individuals' media using behavior: the more people perceive media to be credible, the more they would like to access information as a stable source (Wanta & Hu, 1994). Nguyen (2008) noted that online news attributes, such as immediacy and content-richness could significantly impact online news use frequency and attachment.

Next, individual influence impacts people's media use behavior as well (Rubin, 2009). Specifically, opinion leadership was found to enhance individuals' intention to share information in the online environment (Steffes & Burgee, 2009). Opinion leaders are individuals who would like to transmit information into their social network (King & Summers, 1970). The spreading of an innovation will be accelerated as opinion leaders are involved into the diffusion process (Rogers, 2003). Consequently, opinion leaders in social media should also influence the process of news diffusion.

Finally, regarding the impact of the diffusion network, media use has been found to be influenced by the social networks in which such use occurs (Rubin, 2002). For example, Brown and Reingen (1987) found that strength of social ties and degree of homogeneity, which are applied to characterize a network, could significantly impact individuals' information sharing behavior in face-to-face communication context. Specifically, strong and homogeneous ties are more likely to be activated for the flow of information. Since social media can facilitate the development and maintenance of social networks (Dunne, Lawlor, & Rowley, 2010), characteristics of networks should also exert influential impact on news sharing that takes place in the online community.

To summarize, this study contends that the influence derived from news, individual users, and diffusion networks should be also important determinants of users' news sharing behavior in social media. The impact of these factors on diffusion process are well articulated in the theory of diffusion of innovations (Rogers, 2003;

Wejnert, 2002). Hence, the present research utilizes diffusion of innovations theory as part of the theoretical foundation.

In sum, in order to examine users' news sharing in social media, the present research provides an integrated perspective from a social psychological aspect via the use of uses and gratifications theory and a network environmental characteristic via the lens of the diffusion of innovations theory.

Research Gaps

It is necessary to point out that prior research has applied the uses and gratifications theory and/or diffusion of innovation theory to explore either news sharing in traditional media context or generic information sharing in social media context (e.g., Coursaris, Yun, & Sung, 2010; Gantz & Trenholm, 1979; M. H. Hsu et al., 2007; Lee, et al., 2010; Nguyen & Western, 2007). While these studies are of considerable value, their research focus has not been on news sharing in social media. Hence, their findings may not be entirely applicable to explain people's news sharing in social media platforms. This is due to the differences existing between traditional media and social media, as well as the distinct attributes of news stories from other informational content.

First, news stories are distinguished from other informational content (e.g., professional knowledge, personal information, photos) shared in social media in several aspects. Essentially, a news story is regarded as the report of recent (especially important or interesting) events or occurrences, published or broadcasted through media or interpersonal channels as new information (Simpson & Weiner, 1989). A news story is emphasized much more in the aspects of timeliness, accuracy, objective, as well as its prominence of involvement of people and social responsibility (Shoemaker, 2006; Sundar, 1999). Moreover, news stories have much more direct influence on civic agenda and public opinion (McCombs & Reynolds, 2009). McCombs and Shaw (1972) suggested that information provided by the news media played a significant role in constructing the perceived reality of the world. Consequently, public opinion responds not only to the directly-experienced environment but to the world constructed by news media, even though there exist discrepancies between media news' portrayal and the real situation (McCombs & Reynolds, 2009). For instance, there was an increasing trend in news coverage of

drugs in the 1980s when there was no change in the drug problem in society (Reese & Danielian, 1989). In the 1990s when news media increasingly broadcasted news stories concerned with crime, the crime rate actually kept on decreasing during that period (Ghanem, 1997). Many research scholars explained that such phenomena occurred due to the influence of the news stories portrayed by the media (e.g., Hester & Gibson, 2003; McCombs & Reynolds, 2009)

Second, compared to the traditional media context, social media has altered the relationships between people and news. Rather than passively receiving news delivered by traditional media channels, audiences are now actively participating in producing and disseminating information of news stories. People can post, share and disseminate news topics, links and stories that are of interest to them via a variety of social media platforms. It was found that 28% of Internet users have adopted participatory media platforms to subscribe to news content, and 37% of them have experience in sharing news stories through social media platforms (Purcell, et al., 2010). In addition, social media enable users to construct an online social network to connect with other users. Once involved in the network, individuals can obtain a variety of news from others with whom they are connected and whose preferences concerning news stories may be similar to theirs. Additionally, people can now collectively filter and evaluate news stories in social media, either through explicitly sharing and voting or through implicitly commenting and other user activities (Lerman, 2007). This further enhances the influence of news stories on social media platforms. Put together, the distinct features in terms of content and media channels, coupled with the perceived gratifications of users (e.g., information learning, enjoyment, socializing, status seeking), the distinct attributes of online news (e.g., credibility, quality, liking, relevance), individual influence (e.g., opinion leadership) as well as characteristics of diffusion networks (e.g., homophily, tie strength), are likely to exert influence on users' intention to share news in social media.

Third, to examine users' perceived gratifications, self-reported data, as a form of data collection, has been widely applied in previous studies (e.g., Cho, Chen, & Chung, 2010; Hanson & Haridakis, 2008; Ibrahim, Ye, & Hoffner, 2008). The present research also adopts the self-report approach to collect data, because some measures of variables such as psychological states and intention of future behavior can only be derived from this means (Podsakoff & Organ, 1986). However, self-reported data may

not be sufficient to accurately reflect external environmental factors as well as users' actual sharing behavior. This is because individuals may lack the ability to remember their past behavior and predict their future actions (Armitage & Conner, 2001). Moreover, self-reported data may not be able to accurately capture the network environmental factors (e.g., opinion leadership, tie strength, homophily) as it is difficult for individuals to have accurate network structure information for the social networks that they are a part of. To address this problem, the present research also utilizes secondary data of user's actual sharing behavior in social media platforms to investigate the actual dissemination process of news stories and examines how the network structures affect the diffusion process. Indeed, social media provides researchers with massive quantities of data for analyzing dynamics of individual behavior, the structure of networks and patterns of the information flow within them (Lerman & Ghosh, 2010). In particular, the present research applies social network analysis methods to analyze the secondary data. Social network analysis is the study of social structure and its effects (Garton, Haythornthwaite, & Wellman, 1997). It focuses on the relations among actors, not individual actors or their attributes. It provides the methods to visualize relationship-networks among its users and trace the pattern of communication among them (Lerman, 2007). By harvesting the data recording users' actual sharing behavior and shared news content, it is possible to reveal how informational, individual, and social variables, such as perceived gratifications (Chen, 2011), attributes of information content (e.g., Adamic & Glance, 2005), opinion leadership (e.g., Smith, 2005), homophily (e.g., Kwak et al., 2010; Thelwall, 2009), tie strength (e.g., Gilbert & Karahalios, 2009), may exert influence on the process of news sharing in social media.

Research Objectives

In sum, the purpose of this study is to propose a theoretical framework for understanding and predicting users' news sharing in social media. The proposed model will be validated by both self-reported data collected from users and secondary data harvested from various social media platforms. Specifically, the present research has two objectives:

- First, drawing from the literature on gratification research, this study attempts to identify motivational factors that drive users to share news in social media.
- Second, extending the uses and gratifications theory by identifying influential factors from diffusion of innovations theory, this research provides insights on which factors, in terms of news attributes, opinion leadership and diffusion networks, impact news sharing in social media.

To accomplish these objectives, the present research is divided into two interrelated studies. Study 1 addresses the first and second objectives, which proposes a conceptual model and employs self-reported data for analysis. As discussed above, while self-reported data is suitable for the analysis of individual motivational factors, it may not accurately capture users' actual sharing behavior as well as network environmental factors derived from diffusion of innovations theory. Thus, to address the limitations, Study 2 further accomplishes the second research objective by utilizing secondary data harvested from social media platforms (i.e., Twitter and Digg). It applies social network analysis to investigate the influence of variables identified in Study 1 and how they impact users' news sharing in social media.

The present research is notable in several aspects. To the best of knowledge, this is one of the first studies attempting to assess the motivational factors as predictors of news sharing in social media. Further, by integrating the diffusion of innovations theory with the uses and gratifications theory, the present research attempts to develop a comprehensive conceptual model to explain users' news sharing behavior. Specifically, this study investigates the influence of perceived gratifications (e.g., information learning, enjoyment, socializing, status seeking), attributes of news stories (e.g., credibility, quality, liking, relevance), opinion leadership (e.g., opinion leader, opinion follower), characteristics of the diffusion network (e.g., homophily, tie strength). In addition, this study attempts to validate the influence of these variables using secondary data and social network analysis. In sum, the present research aims to investigate the following research question: *what factors, in the aspects of perceived gratifications, news attributes, opinion leadership, and characteristics of the diffusion networks, may exert significant influence on users' news sharing in social media?*

CHAPTER TWO LITERATURE REVIEW

In this chapter, previous studies concerning news sharing are reviewed, through which the present study builds upon to emphasize the changes brought by social media to news sharing. Next, relevant theories are presented as the foundation for this study. Specifically, several concepts are articulated, including perceived gratifications which are derived from the uses and gratifications theory; news attributes, opinion leadership, and characteristics of the diffusion networks which are based on diffusion of innovations theory.

Past Research on News Sharing

Previous research concerning news sharing mainly focused on the context of traditional media, such as printed media, radio, and television. Such research emphasized the role of face-to-face communication. However, social media has brought changes to how people consume and share news stories.

Traditional Media Context

News sharing research in the traditional media context focused on examining how news reached the public and spread among individuals, and how quickly such diffusion took place (Inoue & Kawakami, 2004; Rogers, 2000). Here, the traditional media context refers to media environments such as printed media, radio, television and other media channels, rather than the Internet. One of the most important studies exploring news sharing was conducted by Deutschmann and Danielson (1960), which is considered to set the research paradigm for subsequent studies (Rogers, 2003). Deutschmann and Danielson found that radio, television, and newspapers were the main sources by which respondents were aware of major news events like President Eisenhower's heart attack, and two-thirds of the respondents discussed these events through interpersonal channels. Later work applied this research methodology to study a variety of major news events, such as the assassination of a U.S. president, the Challenger disaster, the Columbia shuttle breakup, and various breaking news around the world (Glascock & King, 2007; Greenberg, 1964; Mayer, et al., 1990).

Prior news sharing research focusing on traditional media channels produced several findings. Firstly, in terms of news sharing rate, research has found that news events spread much more rapidly than technological innovations, which require just a

few hours instead of months and years. This is because unlike the diffusion process of technological innovations that consists of knowledge, persuasion, decision, implementation, and confirmation stages, news diffusion only requires the awareness-knowledge of the news events among audiences (Rogers, 2003). This further reinforces the notion that the parameters influencing news diffusion in social media may also be different from those influencing technological innovations diffusion. Secondly, the rate and extent of sharing depends on the attributes of the news. For instance, it was found that the more salient the news event, the more rapid and widespread the sharing became (Fleur, 1987; Rogers, 2000). Saliency is “the degree to which a news event is perceived as important by an individual or individuals” (Rogers, 2000, p. 566). Although varying among individuals with different interests and concerns, the perceived saliency of a news event is largely determined by editors of traditional mass media. For example, a news story presented in bold headlines on the front page or allotted more news space is more likely to be regarded as important by readers. How editors present the news event can significantly influence individuals’ perceived saliency, which in turn impact the news sharing process. Third, with regard to topics of news stories shared, past research mainly focused on major news stories with extreme news values (e.g., Bracken et al., 2005; Glascock & King, 2007; Mayer, et al., 1990). It was found that news events with extremely high value were more likely to reach more number of people rapidly by interpersonal communication (Fleur, 1987; Idid, 1994; Inoue & Kawakami, 2004).

In summary, traditional news sharing research focused on exploring the rate of the diffusion process as well as how major news events spread through mass media and interpersonal channels. While some of these findings such as the impact of news attributes may still be valuable to understand people’s news sharing behavior in social media, this stream of work has often been criticized for narrowly focusing on only major news events (Fleur, 1987; Inoue & Kawakami, 2004). Rogers (2000) further explained that the emphasis on major news events in traditional news research was due to the data collection methodology that was based on respondents’ own report of recalling the process of hearing about a news story. Since major news stories were given more space and time for exposure, it was much easier for respondents to remember and recall those stories rather than other routine news events. Nevertheless, major news events are by no means representative of the majority of news stories, and

have impeded scholars from investigating more routine news events that consists of the daily flow of news (Inoue & Kawakami, 2004). Therefore, news sharing behavior should be extended in scope to investigate news stories in general.

Furthermore, social media has changed the way in which people process and consume news, and is significantly different from the traditional media context. For example, in social media, the salience of a news story is mainly determined by the collaborative evaluation of many users rather than few editors (Lerman, 2007). Thus, some of the conclusions derived from traditional media context may not be applicable to explain news sharing in social media context. In other words, people's news sharing behavior should be reconsidered in the context of social media which has brought new directions and opportunities for news sharing research.

Social Media Context

Social media refers to Internet-based services that enable users to contribute, share and evaluate a variety of contents, as well as to communicate and interact with each other (Kim, Jeong, & Lee, 2010; Lerman, 2007). Internet users are spending huge amount of their personal time social media platforms. It was recently reported that users spent around 20% of their desktop computer time and 30% of their mobile time on social media (Pentina & Tarafdar, 2014). One important feature of social media in the context of news sharing is that it allows the creation and exchange of user-generated content (Hermida et al., 2012). Hence, it is not surprising that social media has become an emerging source for users to access news stories (Weeks & Holbert, 2013).

Although there are a variety of social media platforms, many share some common characteristics: 1) users create or contribute content in a variety of media types (Lerman, 2007); 2) the ability to share various forms of multimedia content easily (Xiang & Gretzel, 2010); 3) media content is collectively evaluated by many users, either actively by voting or passively by using content (Lerman, 2007); 4) creation of personal profiles and establishing of online communities (Razmerita, Kirchner, & Sudzina, 2009); 5) support for both synchronous and asynchronous communication between individuals and for accessing content from likeminded individuals (Ahn, in press; Kim, Jeong, & Lee, 2010).

The characteristics of social media make news sharing in social media significantly distinct from the traditional media context. Firstly, social media enhances individuals' participation and interaction as a collaborative community during the news sharing process (Hanson & Haridakis, 2008). In the traditional media context, except for discussing media content with families or friends within a limited network circle, it is almost not possible for individuals to interact with others scattered at different locations. In contrast, social media can help to connect people with distinct cultural and social backgrounds across different societies and nations. Members of virtual communities interact with each other through news content in a variety of ways, such as sharing news stories, leaving comments, and participating in discussions (Dunne, Lawlor, & Rowley, 2010). Indeed, social media has turned news into a social experience: it enables a distributed conversations whereby individuals users can respond to particular news event collectively (Shaw et al., 2013). Once a user finds a news story interesting or important and wants to alert others about it, the user can simply vote for this news story. Hence, the popular news stories are then typically presented in the front page of the social media platforms. In this way, users are able to collaboratively filter news content and help other users in terms of browsing and sharing.

Secondly, content of news stories shared are diversified and individualized on the basis of users' own interests. In the traditional media context, what audiences are exposed to are determined by professional editors who have control on daily content flow (Rogers, 2000). Traditional media channels are always seen as a one-way delivery of media content (Ko, Cho, & Roberts, 2005). People have no choice but to passively receive media content broadcast to them through various media channels. Put differently, what people discuss and share with each other mainly depends on the coverage of mass media. Therefore, news stories presented as headlines in newspapers or broadcast in prime time in television are more inclined to be discussed and shared by audiences (e.g., Glascock & King, 2007; Greenberg, 1964; Mayer, et al., 1990). Unlike the traditional media context, users in social media can actively choose news content from various sources based on their own interests (Szabo & Huberman, 2010). Social media is extending the ability of users to create and receive personalized news streams (Hermida, et al., 2012). Users can thus easily find and retrieve what they intend to watch or read. Moreover, social media facilitates users to identify individuals

with similar interests, which provides the basis of forming connections with like-minded users (Kim, Jeong, & Lee, 2010). This encourages users to interact with each other by sharing and discussing mutually interesting news stories.

Thirdly, the extent of news sharing is expanded in social media. In face-to-face contexts, news is mainly shared through interpersonal communication as individuals talk about news events with each other (Basil & Brown, 1994). The extent of news sharing is limited by one's social network and so the news sharing procedure is short-lived and may cease within few hours/days after news event happens (Glascok & King, 2007; Rogers, 2000). In social media, however, individuals can share and discuss news stories in an asynchronous manner (Lerman, 2007). Users are able to participate in the news sharing process as long as the news event is still on the social media platform. This may comparatively prolong the process of news sharing and enables news to spread to a larger group of users. As social media provides a global scope of audiences, the sharing and discussing of news stories can theoretically take place on a world-wide scale (Hanson & Haridakis, 2008).

Despite the significant role of social media in bringing innovative characteristics to sharing news, few empirical studies have explored factors influencing individuals' news sharing behavior on these platforms. Of these few prior studies, some attempted to reveal motives underlying news sharing behavior in social media. For instance, Hanson and Haridakis (2008) identified that interpersonal communication motives could predict individuals' sharing of news-related videos on YouTube. Chen (2011) concluded that social media users with a need for connecting with other users were more inclined to actively participate in information and news sharing. However, these two studies did not investigate the potential motivational factors derived from sharing of news stories and neglected the influence of social networks in which news sharing behavior takes place.

Other scholars examined the impact of social networks by focusing on users' actual sharing behavior on social media websites. For example, through investigating news sharing behavior of active users on Digg and Twitter, Lerman and Ghosh (2010) found that structure of social networks affected the dynamics of information flow in social media. Specifically, they concluded that news stories shared through dense networks spread faster than news on less dense networks. Cha et al (2010) found that the extent a topic can spawn was partly determined by a minority of influential

individuals who concentrated on certain topics with concerted efforts. In line with Cha et al.'s study, Kwak et al. (2010) revealed that the number of followers that original sharers had did not exert influence on the extent of news sharing in social media platform (i.e., Twitter). Instead, Asur et al. (2011) found that the resonance of the content with users of the social network was crucial in impacting sharing. A common approach of this research cluster is to harvest secondary data from social media platforms and utilize mathematical methods to analyze the data. However, this approach tends to emphasize news sharing as a process driven by technology, and ignore the active role of individual users and the underlying social and psychological factors.

Since social media greatly empowers individuals in the process of news sharing, it is appropriate to examine news sharing from a user-oriented perspective. One such approach is the uses and gratifications theory, which focuses on people's social and psychological motivations underlying media use. Furthermore, as the news itself and social networks may exert influence on individuals' news sharing behavior, this study also incorporates news attributes and social environmental factors into the conceptual framework. In this aspect, the diffusion of innovations theory highlights the important role of opinion leadership and the diffusion network in disseminating innovative ideas and products. In addition, the diffusion of innovations theory considers the impact of innovation attributes, based on which the influence of news attributes can also be defined. The next two sections review these theoretical frameworks.

Uses and Gratifications Theory

In this section, the uses and gratification theory is first introduced. Gratification research about news sharing is then reviewed. As gratification studies have seldom investigated news sharing in the context of social media, the present study includes some work concerning general information sharing in social media. Since information sharing and news sharing are interrelated but distinct concepts, findings in information sharing can contribute to the understanding of news sharing in social media.

The uses and gratifications theory aims to explain what social and psychological needs motivate people to select particular media channels and media content, as well as the subsequent attitudinal and behavioral effects (Diddi & LaRose,

2006; Haridakis & Rubin, 2005; Katz, Gurevitch, & Haas, 1973; Ruggiero, 2000). The key concept of this user-centered approach is that people's media consumption behavior is goal-directed by their needs for satisfying certain gratifications. Generally, perceived gratifications are classified on the basis of media usage orientations, that is, instrumental orientation and ritualized orientation (Hanson & Haridakis, 2008; Rubin, 1984). Instrumental orientation reflect individuals' internal needs for seeking information and knowledge, while ritualized orientation emphasizes emotional experiences and intrinsic needs for pleasure, enjoyment, and diversion from problems and routines (Rafaeli & Ariel, 2008). In other words, instrumental use is derived from information needs, reflecting a more purpose-oriented state, while ritualized use is related to habitual use of media for consuming time and diversion, contributing to a high level of attachment and affinity with the medium (Rubin, 1984).

There are several basic assumptions underlying the uses and gratifications theory (Rubin, 2002): 1) audiences' media behavior is directed by particular needs and goals. These needs are associated with individuals' selection of media and media content, which has consequences for people and society; 2) media audiences are active communicators rather than passive recipients, attempting to satisfy their cognitive and affective needs through utilizing media products and services; 3) individual characteristics and social circumstances, such as personality, social relationships, and media availability, constrain audiences' expectations and mediate media behavior; 4) the audience is at the center of the functional process rather than the media. Media is just the source of message and information, whereas individual initiatives are determinants or mediators of media use, and attitudinal and behavioral consequences. The primary difference between the uses and gratifications theory and traditional media effects research is that from the uses and gratifications perspective audiences actively utilize media to fulfil their needs, whereas a media effects researcher regards audiences as passive receivers on whom mass media can exert direct influence (Rubin, 2009).

Early gratification studies primarily attempted to identify and operationalize various social and psychological variables that were presumed to be motivations underlying audience's media selection. For instance, by analyzing secondary data, Rubin (1983) investigated adults' motivations to view television. They found that motivations were distinct, based on which they classified audiences into two types,

instrumental usage for information seeking and ritualized usage for time consumption and enjoyment. Loges and Ball-Rokeach (1993) explored how the needs readers were pursuing impacted their dependency on newspaper reading. They found that besides demographic variables, readers' orientations of social understanding, self understanding, and information seeking were significantly related to the amount of time spent reading newspapers. Rubin and Step (2000) examined audience' motivations to listen to talk radio and identified that the needs for enjoyment, information, and passing time/habit affected audience's attitudinal and behavioral outcomes. Moreover, their findings illustrated that distinct motivations lead to different outcomes, for example, the enjoyment motivation was related to intentional and frequent radio listening while information and passing time/habit needs predicted attitudinal influence from a radio host.

With the pervasiveness of the Internet, gratification research has extensively explored users' motivations of Internet usage. As the Internet offers users with various means to develop interactive communication, this significantly strengthens user activity as the core concept of gratifications research (Ruggiero, 2000). Compared to audiences in conventional media, Internet users are assumed to be more active and purpose-driven in consuming online service by purposively browsing, searching, and clicking online content (Howard & Corkindale, 2008; Johnson & Kaye, 2000). Papacharissi and Rubin (2000) explored the relationship between personal motivations and the likelihood of the Internet usage. They found that information seeking, interpersonal utility, passing time, enjoyment, and convenience were paramount antecedents to predict various attitudinal and behavioral outcomes of the Internet use, such as Internet exposure, affinity, and satisfaction. Similarly, Lin (2002) revealed that users expected information learning, interaction, and enjoyment gratifications from online media service use.

In the context of social media, the uses and gratifications theory is also applicable to explaining users' media behavior. For example, Lee, et al. (2010) investigated the motivations of content sharing in mobile gaming. Based on the uses and gratification approach, they proposed that information discovery, enjoyment, information quality, socialization, and relationship maintenance were significant predictors of users' intention to use a mobile sharing and gaming application. Dunne et al. (2010) found that perceived gratifications, such as communication, enjoyment,

escapism, relationship maintenance were related to people's need of using social networking sites. Cho, Chen, and Chung (2010) explored why people participated in knowledge sharing in Wikipedia. Based on a survey of Wikipedia users, they identified that sharing intention was motivated by the expectation of interaction (e.g., generalized reciprocity) with other community members. Further, they found that social-relational factors (e.g., sense of belonging, relationship maintenance) were also associated with knowledge sharing intention.

In sum, previous studies applying the uses and gratification theory have verified that audiences actively select among various media sources based the media channels' capabilities in gratifying their needs. The uses and gratifications theory has been demonstrated to be a cutting-edge theoretical approach in the early stages of each new communication media (Rubin, 2002; Ruggiero, 2000). Indeed, this theory is regarded as one of the most influential theories in explaining individuals' media behavior (Krcmar & Strizhakova, 2009).

Gratifications and News Sharing

With regard to motivations underlying news sharing, previous studies have applied the uses and gratifications theory to examine what motivational factors drive people to share news in various media contexts. Rubin and Perse (1987) investigated the relationships between television news gratifications and audience activity using the uses and gratification approach. In their study, they viewed news sharing as a key indicator of individuals' involvement after exposure to news. They found that people driven by instrumental use (i.e., intentional information seeking) of television news were more likely to be involved in sharing news content. This is because instrumental use is based on audiences' intentional seeking and active involvement with media messages, which makes them more prone to media influence. Gantz and Trenholm (1979) explored why people share news through interpersonal communication. They classified motivations for news sharing into four groupings: informational and interest need, social status need, affect expression, and social relationship development. Although this study did not directly apply uses and gratification approach, the underlying assumptions, such as the gratification effect of media content in satisfying individuals' psychological needs, are analogous.

Some research has focused on particular types of news (e.g., tragic news) and explored people's news sharing behavior in various emotional contexts. For instance, by examining people's reactions after the Columbia shuttle disaster, Ibrahim, Ye, and Hoffner (2008) noted that informational and emotional motives were significant predictors of news sharing behavior after the consumption of tragic news. That is, after hearing sad news, people tended to confirm the reliability of the news and acquire more information through sharing with others. In addition, these individuals would seek social support by sharing and discussing the news with others to express their sad emotions. However, tragic news cannot fully represent the daily flow of new stories in our life. So the conclusions may not be generalized to explain general news sharing behavior.

Here, it is necessary to point out that these previous studies explored news sharing using interpersonal communication channels. Scholars have not paid much attention to the innovative characteristics of news sharing and influence brought by social media. Social media has greatly changed individuals' news sharing behavior in terms of interactivity, accessibility, and influence extent (Cha et al., 2010; Chen, 2011; Liu et al., 2011). Specifically, the unique features of social media (e.g. content creation, socialization, commenting) have the ability to change the nature of news sharing and further impact individuals' attitudinal and behavioral outcomes. For instance, social media has become an outlet for emotional expressions especially for distress communications (Shaw, et al., 2013).

In the literature, Hanson and Haridakis' (2008) study directly focused on investigating individuals' motives for news sharing in social media based on the uses and gratifications theory. They explored why users watched and shared news videos in YouTube, a popular social media platform for contributing and sharing videos. By applying exploratory factor analysis and hierarchical regression, they found that both individual personality and gratification factors were associated with news sharing behavior in YouTube. With regard to gratification factors, they identified that needs for enjoyment as key motivations for people to share. Hanson and Haridakis' study demonstrated the viability of the uses and gratification approach in explaining users' news sharing behavior in social media. However, its research scope was limited in the video news sharing. Because video use is different from the usage of other media formats such as text and photos (Sundar, 2000), users' motivations for sharing may

differ. In particular, scholars have investigated Twitter as an important social platform for news and information sharing, attempting to identify motives underlying Twitter use. Holton et al. (2014) found that by posting hyperlinks which directed to news information, users intended to seek information and establish reciprocal relations with other users. This means that there is a need to explore beyond video news sharing.

In sum, prior studies concerned suggest several gratification factors that are associated with people's news sharing in social media. First, information learning, which is derived from people's instrumental media use, can influence people's news sharing (Gantz & Trenholm, 1979; Ibrahim, Ye, & Hoffner, 2008; Rubin & Perse, 1987). Next, perceived enjoyment also drives people to share news stories with others (Hanson & Haridakis, 2008). In addition, people with socializing needs, such as relationship development and interpersonal expression, are inclined to share news (Gantz & Trenholm, 1979; Ibrahim, Ye, & Hoffner, 2008). Lastly, people who share news stories also expect to establish status among their peers (Gantz & Trenholm, 1979). Hence, the present research employs these gratification factors and investigates whether they can explain news sharing in social media.

As few empirical studies have focused on news sharing in social media, the present study draws from literature concerning general information sharing in social media. However, as discussed earlier, there are differences between information sharing and news sharing (e.g., sharing content, social influence, diffusion context) and the conclusions derived from the former may not be fully applicable to explain news sharing behavior in social media. Nevertheless, there are overlaps between the two areas, and thus, findings from such prior work may still be useful in the present research. For example, a widely accepted definition regards information as any stimuli, originating either from an external environment or from an internal world, which makes a difference to a conscious, human mind (Case, 2007). In this sense, news can be viewed as a form of information or a vector of information, although news and information are not equivalent. Altogether, informational content should have some similar capabilities in gratifying people's social and psychological needs despite different forms via different channels. Therefore, this study reviews the information sharing literature concerning motivational studies, which may shed some light for the present news sharing research.

Gratifications and Online Information Sharing

Information sharing research has yielded extensive explanations regarding individuals' motivations to share a variety of forms of content through different media contexts. Some explored information sharing behavior in online communities. For instance, Rafaeli and Ariel (2008) reviewed literature regarding incentives for knowledge contribution in an online community. They argued that gratification factors, including self-identification, personal growth, enjoyment, ritual usage, may be derived from contributing content in online community. Nov, Naaman and Ye (2010) studied the motivational factors that were associated with photo sharing in Flickr, a large online photo sharing community. They identified primary motivations such as commitment to the community, self-development, reputation seeking. Similarly, when studying motivations underlying continued knowledge sharing behavior, He and Wei (2009) found that contributing intention was significantly motivated by gratification factors in terms of social relationships, enjoyment in helping, and influence management.

Based on the uses and gratification approach, Goh et al. (2009) focused on studying users' mobile media sharing behavior. By analyzing data from a month-long diary of users' media sharing activities and post-study interviews, they noted several motivational factors were associated with mobile media sharing, including creating and maintaining social relationships, reminding individual and collective experiences, self-expression, and task performance. In line with Goh et al.'s research, Lee et al. (2010) attempted to examine the motivations for content sharing within a mobile game-based environment. The findings revealed that perceived gratification factors, such as information discovery, enjoyment, socialization, and relationship maintenance were significant in predicting intention to use mobile sharing and gaming applications.

In sum, prior studies have affirmed the appropriateness of the uses and gratifications theory and demonstrated its potential explanatory ability in predicting people's motivations to share content via social media. Specifically, some gratifications uncovered in this stream of work are similar to those identified as influencing news sharing in traditional media, such as meeting information needs, enjoyment, social relationship development, and status seeking (He & Wei, 2009; Lee, et al., 2010; Rafaeli & Ariel, 2008), This further confirms the validity of examining these perceived gratifications in the current study.

It is necessary to point out that the uses and gratification approach by itself may not be sufficient to explain users' media behavior. The theory has been criticized for emphasizing too much on individuals' active role in selecting media content and neglecting the constraints stemmed from social circumstances whereby individuals' attitudes and behavior are shaped (Ruggiero, 2000). To address this deficiency, some gratifications scholars attempted to integrate social factors such as lifestyle, personalities, emotion into the uses and gratifications theory (Krcmar & Kean, 2005; Papacharissi & Rubin, 2000). However, this is still criticized as being too individualistic (Rubin, 2009; Ruggiero, 2000). Ruggiero (2000) argued that uses and gratifications theory should be complemented by other crucial factors reflecting the influence of social circumstances. Other scholars also advocated the idea of integrating social circumstance factors that may impact users' motivations, attitudes, and activities when exploring particular media contexts (Hanson & Haridakis, 2008; Rafaeli & Ariel, 2008).

In addition, the uses and gratifications theory is not able to explain the role and importance of attributes of information content (Wolling, 2009). Therefore, to complement the uses and gratifications theory, the present study intends to integrate the impact of the social network as well as attributes of online news into the conceptual model. Specifically, this study incorporates the diffusion of innovation theory into the uses and gratifications theory.

Diffusion of Innovations Theory

In this section, the diffusion of innovations theory is first described. Specific concepts that are relevant to this study are next discussed, including news attributes, opinion leadership, and characteristics of the diffusion networks (i.e., homophily and tie strength). In addition, this section also discusses how these concepts may be extended to explain news sharing in the context of social media.

Despite the distinct characteristics of innovations across different areas, the diffusion process is essentially similar: a person becomes aware of an innovation and communicates it to other people in a social system (Peres, Muller, & Mahajan, 2010). Others who adopt it may introduce the innovation to others, and so on, until the innovation is diffused in a community (Chatman, 1986). In particular, Rogers' diffusion theory is widely quoted in this field (Chatman, 1986). Rogers' model

provides a systematic explanation of how innovation is communicated through communication channels over time, and evaluated, adopted or rejected among members of a social system (Rogers, 2003). The four main elements are innovation, communication channels, time, and the social system, which are supposed to exert influence on the diffusion process.

An innovation can be an idea or an object that is perceived new by individuals, such as a news event, technological innovations, and new communication technologies (Howard & Corkindale, 2008). Communication is defined as “a process in which respondents create and share information with one another in order to reach a mutual understanding” (Rogers, 2003, p. 5). The communication channel is the means through which information spreads among individuals. It is assumed as a principle of human communication that the transfer of ideas occurs much more frequently among individuals who are similar (McCroskey, McCroskey, & Richmond, 2005). A social system consists of individuals, informal groups, organizations, and/or subsystems (Rogers, 2003). The attributes of the social system can impact the innovation’s diffusion in several aspects. For instance, the social structure of the system reflects the regularity and stability of human behavior which makes collective decisions predictable. In addition, the opinion leaders within a social system are able to influence other individuals’ attitudes and overt behavior, who can also lead to the spread of innovations.

Prior diffusion research has focused primarily on the diffusion of technological products (e.g., Coursaris, Yun, & Sung, 2010; Khasawneh, Regan, & Gillard, 2011). Even though technology diffusion research has shed light on the relevance of Roger’s diffusion theory in understanding factors influencing the diffusion process, most concepts and findings stemming from this stream of work may not be sufficient to explain the diffusion process of innovations with other forms (Vishwanath & Goldhaber, 2003). There are several reasons. First, no physical product exists in news diffusion. Second, unlike technology diffusion which consists of several steps like persuasion, decision, and implementation, news diffusion only requires the awareness-knowledge of the news events among audiences (Rogers, 2003). Indeed, Rogers (2003) also stated that new factors should be taken into consideration when the subject is changed. Further as discussed earlier the parameters influencing news diffusion in social media are likely to be different from those influencing technological innovations

diffusion. Hence, in order to apply this theory, some key concepts need to be reconsidered and modified according to the unique characteristics of news diffusion in social media.

Based on Rogers' diffusion theory, previous studies grouped variables influencing the diffusion process into three clusters (Wejnert, 2002). The first cluster consists of characteristics of the innovation itself. Howard and Corkindale (2008) revealed that attributes of online news services, in the aspects of usefulness, quality, and interface, were significantly associated with people's adoption. The second cluster includes characteristics of the innovation sharers (innovators) who may exert influence on the rate and extent of diffusion. For instance, the importance of opinion leaders has been highlighted for their impact on other people's attitudes and behaviors (Valente & Davis, 1999). The third cluster focuses on characteristics of the diffusion network in which the innovation is shared and spread. For example, the degree of similarity and tie strength among individuals within a social network were found to be significant predictors for information sharing behavior (Steffes & Burgee, 2009).

Correspondingly, these three aspects are also the potential determinants of news sharing in social media. First, news, regarded as an innovation, is the focus of the present study. News attributes have the potential to influence people's sharing behavior after accessing news stories (Nguyen, 2008). Second, opinion leaders and followers also exist in the online environment, and play a role in the diffusion process of informational content (Sun et al., 2006). Third, social characteristics of diffusion networks have been found to be influential in the process of information diffusion in social media (Chu & Kim, 2011). Hence, the present study also examines the influence of the three clusters on news sharing in social media.

News Attributes

According to the diffusion of innovations theory, attributes of innovations are particularly influential in impacting individuals' attitudes and behaviors which further affect the rate of innovation diffusion (Rogers, 2003). Yet, the process in which innovation characteristics influence diffusion patterns can vary among different types of innovations (Nguyen, 2008). With respect to technological products, several paramount attributes (e.g., relative advantage, compatibility, complexity, trialability, observability) have been extensively investigated. For example, relative advantage is

the extent to which an innovation is perceived to be better than the previous one in terms of economic benefit, cost, time and efforts savings (Rogers, 2003). Compatibility is the degree to which an innovation conforms to existing values, past experiences and needs of the potential users (Nguyen & Western, 2007; Rogers, 2003).

It is necessary to note that these attributes are concerned with the diffusion of physical technologies. However, the attributes should be distinct across different innovations. That is, the attributes should be relatively flexible when exploring different kinds of innovations (Howard & Corkindale, 2008; Rogers, 2003). For example, Wolling (2009) concluded that individuals' subjective assessments of the features of media content would influence the subsequent decision to use: the more positive the evaluation is, the more the media product is likely to be regularly used. As discussed earlier, the attributes of news stories are fundamentally different from technological innovations, and thus, the potential attributes that may exert influence on news diffusion should be reconsidered.

Previous studies have identified several attributes concerned with news stories. By emphasizing the concept of newsworthiness, McGregor (2002) proposed several values as criteria for journalists to select news, including visualness, emotion, conflict, and reputation. Gladney et al. (2007) studied online news attributes emphasized by professional editors and revealed several factors that determined the quality of news stories. Specifically, credibility, utility, immediacy, and relevance were ranked as the most important criteria. It is necessary to point out that those news attributes are based on the judgment of professional journalists.

From the perspective of the readers, Johnson and Kaye (2000) employed believability, fairness, accuracy, and depth of information as the criteria for assessing news quality. Gantz et al. (1976) suggested that perceived salience of a news story could impact the rate of sharing. By exploratory analysis of readers' evaluation of a variety of online news stories, Nguyen (2008) noted that attributes such as immediacy and content-richness, could significantly impact use frequency and attachment. Sundar (1999) revealed four key factors concerning online news criteria: credibility, liking, quality, and representativeness. Previous studies showed that the criteria about news are different between users and editors (e.g., Bastos, 2014). Since users are central to the evaluation of the quality of news in social media, it is proper to explore the influence of news attributes stemming from users' criteria.

Opinion Leadership

To investigate the individual influence of news sharing in social media, this study examines the news sharers' characteristics from the lens of the opinion leadership. Opinion leadership is viewed as a process by which people (opinion leaders) influence the attitudes or behavior of others (opinion followers) through information networks (Rogers, 2003; Sun, et al., 2006). In social media, news crowds are playing different roles (Lehmann et al., 2013). According to the direction of information flow, individuals can be categorized as opinion leaders and opinion followers (Flynn, Goldsmith, & Eastman, 1996; Shoham & Ruvio, 2008). Opinion leaders refer to individuals who transmit information about a topic to other people, in terms of the extent to which information is sought by those people (King & Summers, 1970). Opinion leaders obtain their leadership by serving as an outlet for disseminating new information into their social network. They are assumed to have greater exposure to media and stronger desire to control their external environment (Althaus & Tewksbury, 2000). It has been found that in social media, opinion leaders have higher motivations of information seeking and public expression than non leaders (C. S. Park, 2013). Opinion followers, or opinion seekers, are defined as individuals who seek information or opinions in order to find out about and evaluate products, services, current affairs, or other areas of interest (Feick, Price, & Higie, 1986). Though opinion seeking may be regarded as an extreme point on a leadership-seeking scale, these two concepts are distinct and independent (Shoham & Ruvio, 2008; Sun et al., 2006). Feick, Price, and Higie (1986) demonstrated that opinion leaders and opinion followers are two distinct concepts, which should be measured by different constructs.

Traditionally, the influence of opinion leadership is constrained within a limited number of individuals such as family members or friends (Lyons & Henderson, 2005). However, online communities provide opinion leadership with a global scope of respondents. Due to the pervasiveness of the Internet, network speed, convenience, and the absence of face-to-face human pressure, online opinion leadership tends to be more influential (Phelps et al., 2004). In particular, opinion leadership in a computer-mediated environment is characterized in terms of knowledge and experience, exploratory and innovative behavior, and level of involvement (Lyons & Henderson, 2005). Perceived involvement was found to drive people to acquire knowledge and share information about a particular product or service category (Celsi et al., 1992).

Furthermore, opinion leaders were found to exhibit more exploratory and innovative behavior than opinion followers (Lyons & Henderson, 2005). People with greater exploratory and innovative behavior were found to display a higher tendency to acquire information, evaluate for quality and share knowledge (Baumgarten, 1975; Mittelstaedt et al., 1976).

Previous studies have identified that opinion leaders can exert a significant impact in terms of informational influence in the Internet. For instance, Steffes and Brugee (2009) found that the information obtained from online sources was more influential in affecting people's decisions than from conversations with friends. Also, the efforts of opinion leaders can impact the diffusion rate, for it is presumed that the number of adopters per unit of time will increase once opinion leaders are involved into the diffusion process (Rogers, 2003). This conclusion was verified by Bakshy, Karrer, and Adamic's (2009) study who investigated the adoption rate of user-generated content in social media and concluded that users with a large number of connections played a significant role in the adoption process. In social media platforms, as opinion leaders have a large number of followers, the extent of news diffusion should be significantly expanded once opinion leaders are involved in spreading news.

In addition, it is important to note that opinion leadership involves communication between opinion leaders and opinion followers (Feick, Price, & Higie, 1986). Opinion followers are viewed as being at the end of a two-step communication model, in which information is firstly transmitted from mass media to opinion leaders, and then from opinion leaders to opinion follower in the second step (Rogers, 2003). In other words, opinion followers are information targets of opinion leaders. Further, opinion followers have been found to rely heavily on opinion leaders as sources of information, but are less likely to actively seek knowledge about a certain product or topic by themselves (Shoham & Ruvio, 2008). This phenomenon should be also applicable to explain news sharing process in social media. Opinion followers in social media are inclined to receive news shared by opinion leaders who are assumed to process more news messages about certain topics, but opinion followers may not seek and share news as actively as opinion leaders. In parallel, opinion leaders are willing to share news to their followers as this may enhance the perception of themselves as leaders among the network of users.

Diffusion Networks

The third cluster of influential factors impacting news sharing lies in the diffusion network. According to Rogers (2003), individuals are interconnected with each other to form a communication network in which information flows. This is akin to online social networks which are defined as online environments where people create profiles about themselves and connect to others on the site, creating a web of personal connections (Chen, 2011). Social networks can offer emotional support and a sense of belonging for members, which may affect their beliefs and actual behavior (Chipuer & Pretty, 1999). One of the major features of an online social network is the manifestation of links among friends or links with strangers with similar interests (Boyd & Ellison, 2008). In social media, directed links may indicate friendships or common interest. Such directed links represent the flow direction of information and hence reflect characteristics of the social network (Cha et al., 2010). In the online community formed in social media, the characteristics of the social network are assumed to influence people's selections of news content and their news sharing behavior. These include homophily and tie strength, which will be discussed in the following sections.

Homophily

Homophily has been found to exert significant influence on online information exchange (Chu & Kim, 2011; Steffes & Burgee, 2009). Homophily is defined as “the degree to which two or more individuals who interact are similar in certain attributes, such as beliefs, education, social status, and the like” (Rogers, 2003, p. 18). The similarity can be attributed to several aspects, including demographic similarity (Rogers & Bhowmik, 1970), attitude similarity (Berscheid, 1985), status similarity (Griffin & Sparks, 1990) and value similarity (Burlison, Samter, & Lucchetti, 1992).

Previous studies have revealed how individual perceptions of similarity affect interpersonal communication behaviors. McCroskey, et al. (2005) concluded that the more similar the communicators were, the more they were likely to communicate and interact with each other. In turn, the more communication individuals have, the more they become similar to one another. In fact, the perceived similarity within a social network is found to effectively trigger liking and attraction, which is associated with friendship formation and intensity (AhYun, 2002; Selfhout et al., 2009). Consequently,

the exchange of information is much more frequent among individuals who share similar attributes (Rogers & Bhowmik, 1970). Brown and Reingen (1987) found that homophilous sources were more likely to be utilized for information referral because such sources were perceived to be more credible, trustworthy, and reliable (Rogers & Bhowmik, 1970).

Homophily has also been investigated in the computer-mediated communication context. Yuan and Gay (2006) explored relationship development among distributed teams in task-related networks and non-task related networks. In task-related networks, it was found that homophily in terms of group assignment and location had a significant impact on the development of network ties. In non-task related networks, homophily in location was identified as a significant predictor of relationship development. By focusing on information sharing in forums, Steffes and Burgee (2009) investigated how social relationship factors might influence individuals' behavior in terms of information acquisition and evaluation. They found that compared to heterogeneous information sources, information processed from homogeneous sources was more frequently utilized and perceived to be more influential in decision making. Similarly, Mazur and Richards (2011) revealed that adolescents were more likely to interact with persons of the same ethnicity, age, and state in social networking sites.

Indeed, people would like to select their friends on the basis of similar personality, beliefs and attitudes (AhYun, 2002; McCroskey, McCroskey, & Richmond, 2005) and interact with those who share similar characteristics (Mouw, 2006). In the face-to-face communication context, individuals evaluate the degree of similarity based on the perceived characteristics of each other and the messages being exchanged (Rogers & Bhowmik, 1970). However, in social media settings, the cues (e.g., age, gender, speech) based on which individuals evaluate the degree of similarity to others may be absent due to constraints of social presence (Walther & Parks, 2002). In this case, people are able to perceive the degree of similarity and construct meanings of the relationships by relevant communicating behavior (Walther, Loh, & Granka, 2005). For instance, people can perceive the characteristics of a person by observing how the person deliberately decorates and displays his/her personal website (Walther et al., 2008). Music preference was also regarded as a reliable indicator of an individual's personality, based on which people may evaluate the degree of personality

similarity to others (Delsing et al., 2008; Selfhout et al., 2009). Similarly, in social media, users can keep track of others' activities by connecting with them and following their updates. Here, news stories shared by users can be viewed as cues signalling self-attitudes and beliefs. Users tend to connect with others who are similar to themselves in terms of beliefs, interests, or attitudes which are reflected by the shared news stories. Thus news stories shared by a user are more likely to be liked and further shared by his/her connections in social media.

Tie Strength

Within a social network, information can be shared or exchanged through social ties which may vary in terms of the strength (Stephen & Lehmann, 2009). The strength of a tie is characterized by a combination of the amount of time, the emotional intensity, the intimacy, and the reciprocal services (Granovetter, 1973). Generally, within one's social network, an individual has a wide range of relationship ties which could be categorized into strong ties and weak ties (Granovetter, 1983; Steffes & Burgee, 2009). Strong ties refer to the links who may provide emotional support, and whose social circles tightly overlap with one's own (Gilbert & Karahalios, 2009; Goldenberg, Libai, & Muller, 2001). Weak ties, conversely, are merely acquaintances without frequent reciprocal interactions (Granovetter, 1983; Pigg & Crank, 2004). Before the use of electronic communication, strongly linked social groups were primarily geographic (Poe, 2011). With the use of the Internet, the dominant role of geographical association may diminish, and strongly linked social groups may form on the basis of computer-mediated communications and interactions (Herdagdelen et al., 2013).

Social media users may also be connected by different kinds of social ties characterized by the level of intensity of relationships. In the social media context, strong ties can be manifested by various interaction histories including relationship duration, communication reciprocity, interaction frequency, and so on (Gilbert & Karahalios, 2009). In addition, strong ties in social media may be derived from close offline relationships (e.g., classmates, relatives); meanwhile, strong ties may also develop through online interactions among people who do not know each other before joining the online community (Boyd & Ellison, 2008; Steffes & Burgee, 2009). Their strong tie relationships may be developed on the basis of frequent information exchange mainly through social media channels, but without any interactions offline.

While some research suggests that weak ties may help to provide new perspectives and ideas into a community (Granovetter, 1983), strong ties are regarded as much more important sources of information and found to be more influential on individuals' information exchange behavior (Brown & Reingen, 1987; Frenzen & Nakamoto, 1993; Steffes & Burgee, 2009). For example, Brown and Reingen (1987) found that people were more likely to actively search for information from strong ties rather than weak ties. Information from strong tie sources was perceived to be more credible and more influential than that passed by weak tie links (Brown & Reingen, 1987; Rogers, 2003). Frenzen and Nakamoto (1993) also found that people tended to share information with strong tied friends. Steffes and Burgee (2009) argued that since individuals interacted more frequently with their strong tie members than weak tie acquaintances, strong tie relationships have priority as sources of information. In addition, because people in strong tie relationships tend to have a better understanding about what kinds of products or services can satisfy one another's needs, this may lead to more frequent information-exchange between strong tie links (Steffes & Burgee, 2009).

It is necessary to point out that the concepts of homophily and tie strength are to some degree interrelated. They are both characterized by a need for affiliation or a sense of belonging (Chen, 2011). However, they are regarded as different concepts based on distinct constructs (Brown & Reingen, 1987). While tie strength is manifested by the degree of affinity and closeness of the relationships, homophily refers to the level of similarity regarding individual characteristics. Two individuals who are similar to each other in terms of socio-economic background, interest, and/or beliefs, may be just mere acquaintances or complete strangers. Further, people may be also different in various aspects (e.g. preferences, personalities, etc) from their strong ties. Therefore, these two concepts should be investigated separately when exploring the influence of diffusion networks.

In sum, the present research integrates uses and gratifications theory with diffusion of innovations theory to explain the influential factors underlying users' new sharing in social media. By applying uses and gratifications theory, the present research attempts to reveal the social and psychological factors motivate users to share news in social media., To complement uses and gratifications theory which focuses on individual's social and psychological factors, the present research further incorporates

diffusion of innovations theory to highlight the impact of news itself and social environmental factors including opinion leadership, tie strength and homophily. Based on the two theoretical approaches, the present research aims to propose a conceptual model to explain users' news sharing in social media.

CHAPTER THREE CONCEPTUAL MODEL

This chapter proposes the conceptual model that the present research applies to understand the factors influencing users' news sharing in social media. The conceptual model is divided into two parts: one is concerned with perceived gratifications drawn from the uses and gratification theory; the other includes opinion leadership, social environmental factors, and news attributes that are derived from the diffusion of innovations theory. The following sections develop the hypotheses concerning these potentially influential factors.

Perceived Gratifications and News Sharing

As discussed in Chapter 2, while the uses and gratifications theory has been extensively applied to explain motivational factors concerning media use, there is yet little research investigating the gratifications that are derived from news sharing in social media. Since news is influential in impacting individuals' perceptions of the reality, and news sharing behavior contributes to the flow of stories within one's informational circumstance, it is necessary to understand the perceived gratifications underlying such sharing behavior. Specifically, based on the literature review in Chapter 2, the present research investigates how perceived gratifications of information learning, enjoyment, socializing, and status seeking are related to people's news sharing in social media.

Information Learning

The information learning gratification has been traditionally identified as a fundamental need to keep up with all things taking place in the environment (Ibrahim, Ye, & Hoffner, 2008; C. Lin, Salwen, & Abdulla, 2005). It is characterized by a high level of active selection and involvement with the media content (Papacharissi & Rubin, 2000; Rubin & Perse, 1987). Prior studies have found that the perceived gratification of information learning is significantly associated with news consumption behavior. Nevertheless, these studies mainly focused on news reading on the Internet or news sharing in interpersonal communication. For instance, Lin et al. (2005) found that the perceived gratification of information learning is one of the main motives driving users to access online news. Similarly, Ibrahim, Ye, and Hoffner (2008) argued that information learning is associated with people's news sharing during interpersonal communication.

Social media further enhances users' gratification of information learning through a collective sharing and filtering mechanism, as well as satisfies potential information needs. Once submitted onto social media platforms, news stories can be disseminated through users' online social networks easily. As users tend to connect with others who have similar interests (LaRose & Eastin, 2004), it is much easier for them to find content of interest through their networks. Furthermore, news stories shared by individuals can be also archived on social media platforms and become a personal repository of news stories which can be easily accessed and searched to meet future information needs. This cannot be achieved in traditional media easily (Lerman & Ghosh, 2010). Thus, news sharing in social media can help users seek information satisfying current as well as future information needs. This is supported in prior research showing that people who share content in social media are anticipating to seek relevant information in the future, as well as to facilitate others' potential information needs (Low, Goh, & Lee, 2010). Given the potential of social media to satisfy individuals' information needs, the following hypothesis is proposed:

H1a: Perceived gratification of information learning is positively associated with users' news sharing in social media.

Enjoyment

The enjoyment construct refers to the ability of media to entertain and satisfy users who are seeking fun through media usage (Luo, 2002). It may be derived from the usage of media channels that can satisfy users' enjoyment needs (Lee et al., 2010). It may also stem from helping others through sharing informational content (C. Hsu & Lin, 2008). Here, by helping others to obtain relevant information, users may obtain satisfaction and pleasure from their altruistic behavior (Wasko & Faraj, 2000). This in turn further encourages users' sharing behavior (Kankanhalli, Tan, & Wei, 2005).

Previous research has identified perceived enjoyment as impacting content sharing in the online environment. For example, Hsu and Lin (2008) found that perceived enjoyment was positively related to attitudes toward blogging. Similarly, Nov et al. (2010) proposed enjoyment as an intrinsic motivation to encourage users to share photos. Thus, it is reasonable to assume that users' news sharing behavior may also be motivated by enjoyment gratifications. After sharing news stories, users may be involved in discussing, gossiping, and rating the events delivered within news

content (Lerman & Ghosh, 2010). In addition, content sharers may also enjoy helping others to find useful information and knowledge (He & Wei, 2009). Further, Hanson and Haridakis (2008) identified that perceived enjoyment was positively related to sharing news-related content (e.g., entertainment news videos) on YouTube as such news content provides users with leisure and enjoyment. This argument can be extended to news sharing in other social media platforms due to the common characteristics shared among the different types of platforms. Hence, news sharing is assumed to be perceived as a source to attain enjoyment, and this research proposes that:

H1b: Perceived gratification of enjoyment is positively associated with users' news sharing in social media.

Socializing

Social media is often characterized by interactivity in terms of social relationship development among users. Social media empowers individuals with the capability to enlarge their social networks and create relationships which cannot be achieved through traditional media (Boyd & Ellison, 2008). Indeed, social media is increasingly utilized for socializing, which can facilitate interpersonal communication and relationship development (Grace-Farfaglia et al., 2006; N. Park, Kee, & Valenzuela, 2009).

Prior research has already noted that social media use is motivated by the socializing gratification. For example, by interviewing more than 100 users of social networking sites (e.g., MySpace and Facebook), Raacke and Bonds-Raacke (2008) found that socializing was the most popular expectation of respondents, for example, "to keep in touch with old friends", "to make new friends". Park, Kee, and Valenzuela's (2009) study indicated that college students are mainly driven by social needs when joining online groups. Likewise, the need for socialization is also reported in past research on news reading on the Internet (Howard & Corkindale, 2008). While past research mainly focused on general use of social media, the present research focuses on news sharing specifically. With regard to news sharing in social media, Hanson and Haridakis (2008) further revealed that users who contribute news videos are motivated by potential interpersonal communication with other viewers, suggesting that socializing is positively related to consumption of online news services.

The present research argues that because social media platforms for news sharing offer features for discussion, idea exchange, and other social interaction (Lerman & Ghosh, 2010), they potentially foster the development and maintenance of relationships. Thus, the following hypothesis is proposed:

H1c: Perceived gratification of socializing is positively associated with users' news sharing in social media.

Status Seeking

Status seeking has been shown to be a strong motivation for participation in online environments (Marlow, 2006). In particular, sharing informational content can facilitate users in increasing their status in online communities (C. Hsu & Lin, 2008). If the information shared is subsequently judged to be sound and relevant, it may enhance the sharer's reputation and popularity among peers (Rafaeli & Ariel, 2008).

In social media, users may attempt to establish their status by sharing news and exchanging ideas, which may contribute to the feeling of being important and looking outstanding. Donath (1999) argued that individuals actively participate in online social interaction based on the expectation that it will gain social rewards such as status and respect. Wasko and Faraj (2005) also found that in online networks, people are willing to contribute knowledge to the community when they think it may enhance their professional reputation and status. Taken together, this research argues that as social media platforms offer various social interactions through news sharing, they may potentially enhance the reputation and popularity of users who share news. Therefore, this research presents the following hypothesis:

H1d: Perceived gratification of status seeking is positively associated with users' news sharing in social media.

Diffusions of innovations and News Sharing

In this section, relationships between variables derived from the diffusion of innovations theory and news sharing are discussed. Specifically, hypotheses are developed concerning the influence of news attributes, opinion leadership, homophily and tie strength of the diffusion networks.

News Attributes

According to the diffusion of innovations theory, innovation characteristics can play an important role in the diffusion process (Rogers, 2003). The present research thus considers the characteristics of online news as potential factors influencing users' news sharing. As discussed earlier in Chapter 1, news can also be considered an informational innovation, of which the diffusion process may be explained by the diffusion of innovations theory (Chatman, 1986; Rogers, 2003; Shoemaker, 2006).

Prior research has identified that individuals' perceptions of characteristics of information content are influential determinants in its diffusion process (Agarwal & Prasad, 1997; Rogers, 2003). For instance, Dennis (1996) found that both information credibility and salience would influence members' attitudes towards information utilization. Hsu, Lu, and Hsu (2007) found that users' perceptions of multimedia messaging services, such as perceived advantage, compatibility, visibility, and image, can exert a significant influence on the adoption of mobile services.

In terms of news, research also provides evidence about the impact of news attributes in individuals' news consumption behavior (e.g., Gantz, Trenholm, & Pittman., 1976; Gladney, Shapiro, & Castaldo, 2007). As discussed in Chapter 2, the criteria for news stories are different between journalists and readers (Sundar, 1999). Specifically, according to the readers, the criteria for news stories include credibility, liking, quality, and representativeness, while to the journalists the criteria are emotion, conflict, and reputation, etc. As the present research focuses on news sharing by users, their criteria should be taken into consideration rather than those of journalists. From the perspective of users, news attributes, such as believability, fairness, accuracy, content-richness, relevance are important criteria for assessing news quality (Johnson & Kaye, 2000; Nguyen, 2008). Collectively, drawing from Sundar (1999) and (Johnson & Kaye, 2000; Nguyen, 2008), four key criteria underlying users' perceptions of news were identified, including credibility, liking, quality, and relevance.

News credibility refers to the believability of news content, which includes the dimensions of reliability, trustworthiness, bias, and other related concerns (Abdulla et al., 2005; Flanagin & Metzger, 2000). Credibility has become an influential factor for content selection at a time of information overload (Savolainen, 2011; Schweiger,

2000). Prior studies have found that perceived credibility of media content is an important predictor of people's communication behavior. For instance, Chaffee (1982) found negative correlations between media use and perceived credibility of media content. Similarly, Kiouisis (2001) showed a negative relationship between interpersonal discussion of news and perception of credibility for television news. Marettand and Joshi (2009) also found that people would like to transmit information with little credibility (e.g., rumor), providing chances for validation, reducing anxiety, and amusement. The present research contends that the perception of news stories in social media may also have similar impact on sharing behavior. Stated differently, the less credible a news story is perceived to be, the more likely it is to be discussed and shared by people. Hence the following hypothesis is proposed:

H2a: Perceived credibility of news is negatively associated with users' news sharing in social media.

Next, news liking underlies users' interest toward the content of the news stories in social media (Sundar, 1999). The perception of liking is on the basis of people's evaluation of stimuli in terms of anticipated hedonic impact and corresponding affective value (Litman, 2005). Perceived liking of information has been found to be related to individuals' information exposure (Vettehen, Nuijten, & Peeters, 2008). That is, people are more likely to seek and interact with informational content that they like. Hence, the probability for preferred information to be shared and discussed is increased. This is confirmed by Mojzisch, Grouneva, and Hardt (2010) who found that people discussed information that is consistent with what they liked. Regarding news, Prior (2003) found that news liking can significantly influence people's news selection behavior. If a news story or topic is liked by a reader, he/she may actively seek related stories and further share and discuss with others. As social media facilitates the processes of news seeking and sharing, the present research proposes that the perceived liking of news stories should enhance users' intention to share with others. Accordingly, this research hypothesizes that:

H2b: Perceived liking of news is positively associated with users' news sharing in social media.

News quality is identified as the extent to which users perceive news to be well-written, current, and accurate (Rieh, 2002; Sundar, 1999). Perceived quality of

information is an influential factor that impacts decisions about what content should be selected (Rieh, 2002). Lee et al. (2010) suggested that information quality is significant in predicting intention to share mobile content. Lin et al. (2005) proposed a number of reasons that could facilitate online news adoption, in which of online news quality is a primary factor. This argument is applicable in the context of news sharing because people would like to read news stories with a relatively high level of quality. This means that high quality news stories are likely to be shared and discussed more frequently. In addition, sharing good quality informational content is expected to enrich knowledge in the community, and this may motivate users share for the sake of the community (Chiu, Hsu, & Wang, 2006). This effect should also exist for news sharing in social media. Hence, the following hypothesis is stated:

H2c: Perceived high quality of news is positively associated with users' news sharing in social media.

Relevance manifests in the judgment of the quality of the relationship between a user's information need and the information itself, and this is based on a cognitive and dynamic process that involves knowledge and perceptions that the user brings to the information situation (Barry & Schamber, 1998; Spink, Greisdorf, & Bateman, 1998). In the case of news, relevance may depend on readers' evaluations in terms of topic interest, stage of knowledge, pragmatic utility, and emotional reaction. In other words, the evaluation of relevance is related to users' experience, cognitive state and perceptions (Barry, 1994). Previous research has identified that perceived relevance is significantly associated with people's information sharing behavior. Wasko and Faraj (2005) further argued that individuals' evaluation of knowledge relevance is influential in the process of contributing information in online social networks. Zimmer et al. (2010) found that information relevance is a critical antecedent to information disclosure. In news sharing, Hanneman and Greenberg (1973) argued that news relevance is an important predictor of news sharing in fact-to-face communication. Heath (1996) suggested that people's news sharing behavior is influenced by the relevance in terms of emotional reaction. In social media, it is also possible that users tend to share news stories that are considered to have a high level of relevance in terms of topic interest, salience, and/or emotional state. Given the importance of relevance in people's news sharing behavior, the present research hypothesizes that:

H2d: Perceived relevance of news is positively associated with users' news sharing in social media.

Opinion Leadership

According to Rogers' (2003) diffusion model, opinion leadership plays an important role in diffusion networks. Opinion leadership is manifested in the communication process whereby participants are categorized into opinion leaders or opinion followers (Flynn, Goldsmith, & Eastman, 1996; Shoham & Ruvio, 2008). Opinion leaders act as information brokers or information transmitters intervening between mass media and informational sources of the population (Chu & Kim, 2011; Feick & Price, 1987). Opinion followers are likely to rely on opinion leaders to process information and are relatively passive in terms of information seeking and sharing (Shoham & Ruvio, 2008).

Within a social network, opinion leaders, often perceived as high in status, can significantly impact the innovation diffusion process (Rogers, 2003; Wejnert, 2002). In online environments, people who perceive themselves as opinion leaders are characterized by a relative high level of knowledge, innovative behavior, and involvement (Lyons & Henderson, 2005). They are capable of acquiring news stories over a variety of topics (Cha et al., 2010). In addition, opinion leaders tend to exhibit more exploratory and innovative behavior, including information seeking and sharing (Baumgarten, 1975; Lyons & Henderson, 2005). Lastly, with a high level of community involvement, opinion leaders are more likely to share information about certain topics (Celsi et al., 1992).

Opinion leaders' tendencies for information sharing has been established in many domains, such as technology adoption, marketing, and online word of mouth (e.g., Feick & Price, 1987; Sun et al., 2006; Valente & Davis, 1999). For instance, in marketing, online opinion leaders are more active than the average Internet user in utilizing social media for forwarding website information to others (Cakim, 2007). Regarding online word of mouth, Sun et al. (2006) found that self perception of opinion leadership was significantly related to information sharing in the online environment. Consistent with the understanding of characteristics of opinion leaders, the present research argues that social media users who perceive themselves as opinion

leaders have a greater tendency to share news stories. Hence, the following hypothesis is proposed:

H3a: Users who tend to be opinion leaders are more likely to share news in social media.

Opinion leaders cannot exist without opinion followers (Sun et al., 2006). Opinion followers are targeted by opinion leaders in the diffusion process (Flynn, Goldsmith, & Eastman, 1996). Shoham and Ruvio (2008) argued that opinion followers tend to be less innovative and knowledgeable than opinion leaders. That is, compared to opinion leaders, opinion followers are reluctant to behave innovatively within their diffusion network, but are likely to depend on information and instructions from opinion leaders. This is partly due to opinion followers' reluctance to stand out in a social group (Bertrandias & Goldsmith, 2006). In social media platforms, it may thus be argued that opinion followers would prefer to obtain news information from their connections, and are less likely to share news themselves. Hence, the present research proposes that:

H3b: Users who tend to be opinion followers are less likely to share news in social media.

Diffusion Networks

The diffusion of innovations theory also proposes that the characteristics of diffusion networks can influence the spread of innovations (Rogers, 2003). Specifically, the present research examines two characteristics of the diffusion networks, i.e., homophily and tie strength. These two constructs have been found to be influential factors that affect sharing of information in both offline and online contexts (e.g., Brown & Reingen, 1987; Chu & Kim, 2011).

As discussed earlier, homophily reflects people's tendencies to associate with others who are similar to themselves, either based on geographical proximity, cultural background, social status, occupation, attitudes, or/and values (Makela, Kalla, & Piekkari, 2007). Basically, people would like to interact with those who are similar to themselves (Steffes & Burgee, 2009). Put differently, an interpersonal connection is more likely to occur between similar people. This provides the potential communication channels for interpersonal interaction and information flow. Indeed, the phenomenon of homophily is argued to constrain one's social world and further

determines the information flow and the scope of social interaction (McPherson, Smith-Lovin, & Cook, 2001).

Empirical studies have demonstrated that information sharing behavior is more likely to take place in homogeneous diffusion networks. Brown and Reingen (1987) found that individuals are inclined to utilize homogeneous connections as sources of information. A similar conclusion was found in Steffes and Burgee's (2009) study, in which they revealed that homophily could foster social networking as a primary means for online information sharing. Makela et al. (2007) explained that interpersonal similarity can help to breed informal connections and lead to interactions whereby information exchange is a natural product. Moreover, they suggested that interactions among similar individuals can in turn enhance the effect of clustering and increase the sharing of knowledge.

Given the influence of homogenous social networks on information sharing, this research proposes that this effect should be extended to news sharing in social media. In social media, users may tend to connect with others who have similar characteristics in aspects of demographics, attitudes, and informational interests (Boyd & Ellison, 2008; LaRose & Eastin, 2004). In particular, similarity in terms of informational interests is important in social media as social media users can be connected with people with similar interests easily. Furthermore, the sharing behaviours of a network with users with similar information interests may differ from those with more diverse information interests. Specifically, in a more homogeneous networks, users are more familiar with the news others in the network would like to read and as such will like be more motivated to share more (Rafaeli & Ariel, 2008). Therefore, the present research hypothesizes that:

H4a: Users who are in more homogeneous diffusion networks are more likely to share news in social media.

In addition, network links may influence information sharing attitudes and behavior (Chiu, Hsu, & Wang, 2006). According the Rogers' (2003) diffusion model, network links can be classified on the degree to which information is transmitted. Specifically, network links can be classified into strong ties and weak ties, according to the level of emotional intensity of social relationships (Granovetter, 1983). Strong ties are considered to occupy a privileged position in the information sharing process

because of interpersonal affiliations (Reagans & McEvily, 2003). A strong tie is characterized by its high levels of perceived intimacy, interpersonal closeness, and communication frequency among members (Chiu, Hsu, & Wang, 2006; Kang, 2009). That is, compared to members of weak ties, people involved in strong tie relationships feel more intimate and close to each other, and are likely to exchange information with each other.

Previous studies have identified that people are inclined to share information with close relationships, known as a “strong tie bias” (Stephen & Lehmann, 2009). For example, Lai and Wong (2002) found that people share information with strong ties in rumor spreading. Reagans and McEvily (2003) also concluded that individuals who have a strong emotional attachment are more likely to share knowledge, partly due to the needs of reciprocity and relationship maintenance. Chiu et al. (2006) suggested that social relation links are positively related to quantity of knowledge sharing. Focusing on online information sharing, Chu and Kim (2011) identified tie strength as an important driver for word of mouth behavior. Regarding news sharing in social media, this research expects similar effects stemming from strong ties. Here, the following hypothesis is proposed:

H4b: Users who are in stronger tie diffusion networks are more likely to share news in social media.

In sum, the present research develops a conceptual model by integrating the uses and gratifications theory and the diffusion of innovations theory, aiming to understand what perceived gratifications, news attributes, as well as individual and social characteristics, may influence users’ news sharing in social media. The entire conceptual model is presented in Figure 3.1.

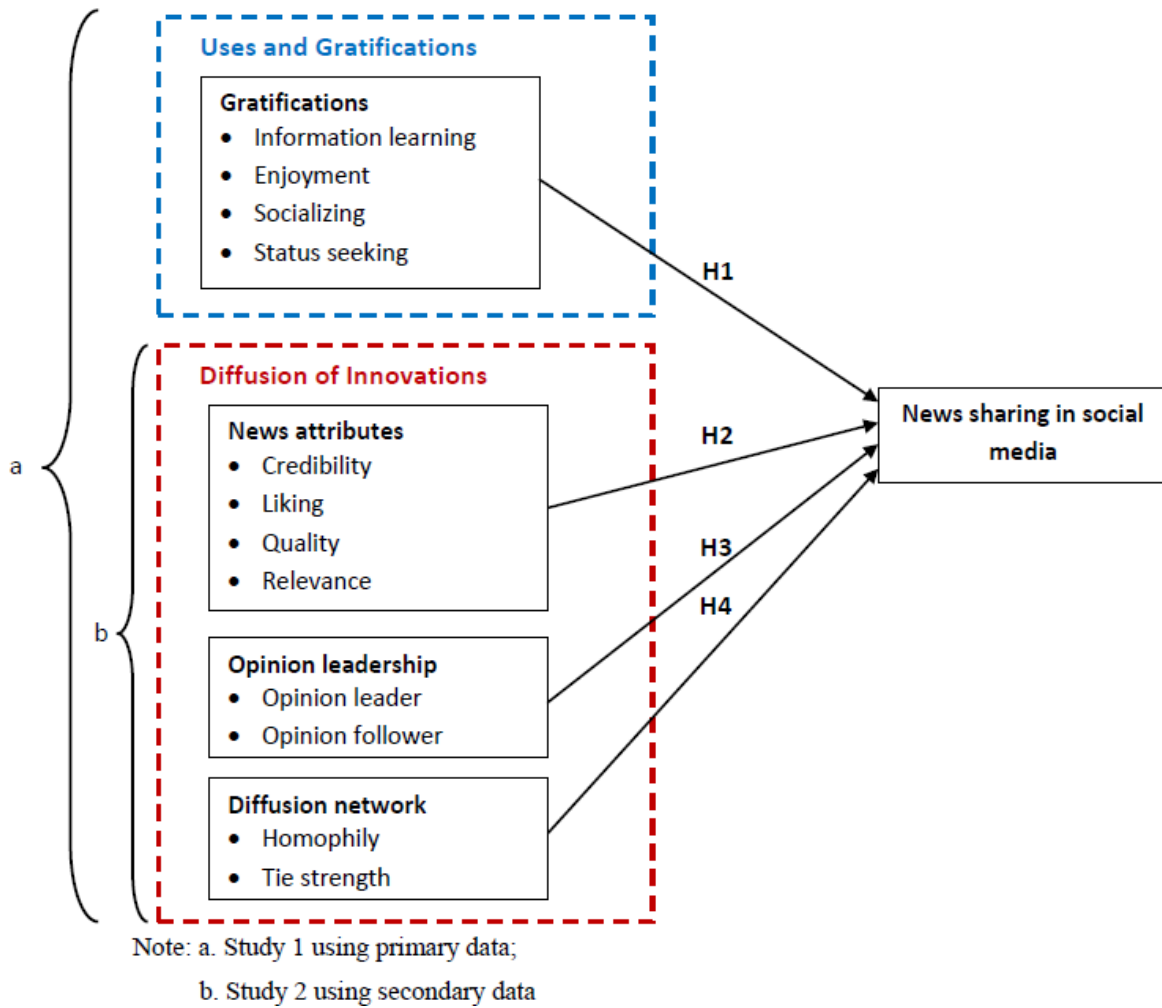


Figure 3.1 the Conceptual Model

The present research utilizes two different studies to verify the influential factors impacting users' news sharing in social media. Based on the conceptual model, Study 1 provides insights on how perceived gratifications, news attributes, opinion leadership, and diffusion networks may impact news sharing in social media by employing self-reported data for analysis. This study aims to answer the following research question: what motivational and environmental factors influence users' news sharing in social media? Through analyzing primary data, the study attempts to reveal the social and psychological factors underlying users' news sharing in social media. However, self-reported data may not accurately reflect users' actual sharing behavior in social media, because individuals may lack the ability to remember their past behavior and predict their future actions (Armitage & Conner, 2001). Also, users may not be knowledgeable about the social network environment they are a part of. Thus, Study 2 complements Study 1 by analyzing secondary data online. Through an in-depth analysis of secondary data obtained from social media platforms, Study 2 will

validate how environmental factors (including news attributes, opinion leadership, homophily, tie strength), derived from diffusion of innovations theory, impact users' news sharing in social media. Study 2 attempts to address the following research question: How do characteristics of diffusion networks, opinion leadership, and news attributes, impact users' news sharing in social media? Essentially, Study 1 and Study 2 examine users' news sharing from different perspectives of news sharing. Through the use of self-reported data, Study 1 examines users' intention to share news and self-reported online news sharing behaviour. Study 2 investigates users' actual sharing behaviour through the use of secondary data from selected social media sites. The hypotheses are listed in Table 3.1

Table 3.1 List of Hypotheses

- H1a: Perceived gratification of information learning is positively associated with users' news sharing in social media.
- H1b: Perceived gratification of enjoyment is positively associated with users' news sharing in social media.
- H1c: Perceived gratification of socializing is positively associated with users' news sharing in social media.
- H1d: Perceived gratification of status seeking positively associated with users' news sharing in social media.
- H2a: Perceived credibility of news is negatively associated with users' news sharing in social media.
- H2b: Perceived liking of news is positively associated with users' news sharing in social media.
- H2c: Perceived high quality of news is positively associated with users' news sharing in social media.
- H2b: Perceived relevance of news is positively associated with users' news sharing in social media.
- H3a: Users who tend to be opinion leaders are more likely to share news in social media.
- H3b: Users who tend to be opinion followers are less likely to share news in social media.
- H4a: Users who are in more homogeneous diffusion networks are more likely to share news in social media.
- H4b: Users who are in stronger tie diffusion networks are more likely to share news in social media.

CHAPTER FOUR STUDY 1

Study 1 attempts to achieve the first and second research objective by analysing primary data. Specifically, by integrating uses and gratifications theory with diffusion of innovations theory, the present study aims to reveal what factors, in terms of perceived gratifications, news attributes, opinion leadership, and characteristics of diffusion networks, may exert influence on users' news sharing in social media.

Methodology

In this chapter, methods for testing the hypotheses developed in Chapter 3 are discussed. The sampling frame and data collection methods are introduced first, followed by the measurements of the variables involved in the conceptual model. Specifically, the present study applies hierarchical regression to analyze the relationships between those variables and users' news sharing in social media.

Sample

With regard to the sampling frame, a common drawback for sampling Internet users is the difficulty in knowing the full population of users (Chen, 2011). This makes the random sampling frame problematic and infeasible (Andrews, Nonnecke, & Preece, 2003; Couper & Miller, 2008). Alternatively, a non-probability sampling method, convenience sampling, is most commonly used in research studying users' behavior (Stangor, 2010). In convenience sampling, researchers simply use individuals who are easy to recruit as respondents: people are selected on the basis of their availability and willingness to participate. Although this method provides no guarantee of a representative and unbiased sample, convenience sampling has advantages in aspects of ease to conduct, low cost, and timeliness (Stangor, 2010). Moreover, some strategies can help to minimize potential problems of convenience sampling, such as targeting at a reasonably representative group without strong bias (Stangor, 2010).

Hence, the present study adopted this sampling method and developed a survey instrument administered to undergraduate and graduate students at a major local university. This group may reasonably represent the population that are involved in online news consumption. Critics argued that demographics of students are homogeneous and their lifestyles may be different from non-students in many aspects,

which makes the validity of results suspect (Diddi & LaRose, 2006). However, college student samples have been widely used in studies relating to Internet use, because they have Internet experience and access to the Internet on campus (Pornsakulvanich, Haridakis, & Rubin, 2008). Further, they are part of the trend in social media usage (LaRose & Eastin, 2004). Therefore, the present study contends that the sample consisting of undergraduate and graduate students is suitable for exploring patterns of news sharing in social media.

Data Collection

Data was collected via a paper-based survey. The data was collected from December 2010 to April 2011. The researcher approached several class instructors and got approval from them to invite the students in their classes to participate in the survey. The students were from a variety of disciplines, including computer science, engineering, business, social science and so on. All respondents were briefed about the purpose of the research and provided with information regarding their privacy and confidentiality of their participation. Participation was voluntary and anonymous. A total of 318 questionnaires were collected, of which 8 respondents reported that they had no social media account of any form. These were deleted from the sample, resulting in a final sample size of 310 respondents. The demographics of the sample are shown in Table 4.1.

Table 4.1 Sample Demographics (N=310)

Demographic variable	Count	%
<i>Gender</i>		
Male	148	47.7
Female	162	52.3
<i>Age</i>		
Less than 20	20	6.5
21-25	126	40.6
25-30	95	30.6
30 or over	66	21.3
<i>Educational background</i>		
Junior College	60	19.4
Bachelor's Degree	151	48.7
Master's Degree	89	28.7
Doctorate Degree	10	3.2

Operational Measurement

The measurements assessing the perceived gratifications, news attributes, opinion leadership, and social environmental characteristics were all adapted from prior research (Bock et al., 2005; Chiu, Hsu, & Wang, 2006; Flynn, Goldsmith, & Eastman, 1996; Lee et al., 2010; McCroskey, McCroskey, & Richmond, 2005; Sundar, 1999; Zimmer et al., 2010). A total of 51 question items were asked to assess those independent variables. Specifically, 18 question items were utilized to measure perceived gratifications, including information learning, enjoyment, socializing and status seeking. 8 items were applied to measure the degree to which users perceive themselves as opinion leaders or opinion followers on social media platforms. Another 8 items were developed to measure characteristics of diffusion networks, such as homophily and tie strength. The rest of the 17 items were used to measure news attributes in terms of credibility, liking, quality and relevance. All questions were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A copy of the questionnaire is shown in Appendix A.

To test measurement reliability, Cronbach's alpha was employed and this showed acceptable value for all constructs (see Table 4.2 to Table 4.5).

In addition, principal component factor analysis with Varimax rotation was used to test the validity of all the constructs in the conceptual model. Varimax rotation, which is an orthogonal rotation of the factors is used to facilitate the interpretation of results (Abdi, 2003). The final factor analysis results are shown in Appendix B and the loading factors for all the constructs are presented in Tables 4.2 to 4.5. Eleven factors emerged with all eigenvalues greater than 1.00. The factor loading for most items exceeded the recommended level of 0.5. Some problematic items were dropped due to issues of low-loading (0.5 or below) and cross-loading (Costello & Osborne, 2005). The measurement model demonstrated adequate reliability and convergent validity.

According to the factor analysis (refer to Appendix B), three items (i.e., “on this social media platform, news stories contributed by users are concise”, “some users in this social media platform are influential, acting as opinion leaders”, “I enjoy sharing news stories with the people who are in my online social network.”) were dropped due to their low loadings. In addition, it should be noted that items from news liking and news relevance, from the news attributes group, were loaded together. This indicates that on the basis of users’ evaluations, news liking and news relevance are highly interrelated. Indeed, news relevance is reflected in several dimensions, one of which is topic interest (Barry & Schamber, 1998). Put differently, news stories that users are interested in are considered to be relevant to their state of informational need. Likewise, liking is also based on users’ interests of news stories (Sundar, 1999). In this way, news liking and relevance are combined as one factor to manifest users’ judgments about what news stories are worthy of sharing.

The remaining 48 items from the perceived gratification constructs fell into 11 factors, representing four aspects (perceived gratifications, news attributes, opinion leadership, and characteristics of diffusion network) that may influence users’ news sharing (see Tables 4.2 to 4.5).

Specifically, the descriptions of the constructs are articulated as the following. Firstly, there are four perceived gratifications derived from news sharing in social media, i.e., information learning, enjoyment, socializing, and status seeking (Table 4.2). Measurements were adapted from previous studies (e.g., Lee et al., 2010; Lin, Salwen, & Abdulla, 2005; Park, Kee, & Valenzuela, 2009).

Table 4.2 Measurement and Factor Analysis of Perceived Gratifications

Perceived Gratifications	Scale items	Factor loadings	Mean	Std. deviation	α
Information learning	Because it helps me to store useful information.	.769	3.06	1.103	.89
	Because it is easy to retrieve information when I need.	.795	3.14	1.153	
	To keep up to date on the latest news and events.	.676	3.40	1.076	
	To get information about something.	.622	3.39	1.051	
Enjoyment	Because it is entertaining	.549	3.60	.938	.90
	Because it helps me pass time.	.796	3.33	1.108	
	To combat boredom.	.842	3.21	1.120	
	Because it helps to relax.	.828	3.19	1.115	
	To get away from pressures.	.821	3.10	1.153	
	To role play or experiment with my identity	.529	2.72	1.111	
	Because it is a pleasant break from my routine	.726	3.27	1.068	
	Because I can interact with people when sharing news.	.738	3.43	1.082	
Socializing	To keep in touch with people.	.747	3.48	1.123	.86
	Because it is effective to exchange ideas with other people.	.759	3.57	1.020	
	To help others to access useful information.	.541	3.41	1.050	
	Because it helps me feel important when sharing news.	.759	2.98	1.087	
Status seeking	Because it helps me to gain status when sharing news stories.	.813	2.84	1.066	.92
	Because it helps to look good when sharing news stories.	.803	2.84	1.099	

- “Information learning” refers to the extent to which news stories shared in social media can satisfy users’ current information needs as well as potential future information needs. Without time and space barriers, social media can provide users with timely access to news content about various topics. In addition, as news stories shared by a user can be automatically recorded in

one's online profile, useful information may be retrieved when the need arises. There are four items measuring users' perceived gratification of information learning. All four items are summed and averaged to represent the value of the information learning gratification. The mean of the index is 3.25 (SD = 0.95, Cronbach α = 0.89). Higher scores indicate a higher level of perceived information learning from news sharing in social media.

- "Enjoyment" reflects the way in which social media serves as a means for deriving entertainment by being involved in news sharing. This is consistent with research showing that media usage can satisfy users' needs for enjoyment, emotional release, and anxiety relief (McQuail, 2005). As for news sharing in social media, users may express their emotions and find relaxation through sharing news content. Seven items are used to measure users' perceived enjoyment of news sharing in social media. The mean of the enjoyment gratification is 3.20 (SD = 0.86, Cronbach α = 0.90).
- "Socializing" describes how the activity of news sharing may facilitate maintenance and development of interpersonal relationships in the online community. Through sharing news in social media, users within the same online community may also participate in discussions, idea exchanges, and other social interactions. This may help them better know each other and increase familiarity among users. Four items are employed to measure users' perceived gratification of socializing. The mean is 3.47 (SD = 0.90, Cronbach α = 0.86).
- "Status seeking" refers to how sharing news in social media helps one to establish reputation and attain status among users. In online environments, status attainment has been found to motivate users to participate in community activities. In the case of social media, sharing news may contribute users for feeling of being important and looking outstanding among users. There are three items to measure perceived gratification of status seeking and the mean is 2.88 (SD = 1.00, Cronbach α = 0.92).

Secondly, users evaluated attributes of news stories in social media based on 16 question items. They were drawn from previous studies (Spink, Greisdorf, & Bateman, 1998; Sundar, 1999) and modified to suit the current context. In the factor

analysis, three factors were extracted comprising liking/relevance, quality, and credibility (Table 4.3).

Table 4.3 Measurement and Factor Analysis of New Attributes

News Attributes	Scale items	Factor loadings	Mean	Std. deviation	α
Liking/ Relevance	I enjoy reading news stories generated by users on this platform.	.743	3.46	.850	.85
	I find these news stories interesting.	.750	3.55	.812	
	The news stories are always conveyed in a lively way.	.504	3.28	.834	
	News stories on this platform are reported in a timely manner.	.586	3.38	.995	
	Comments left by users make news stories more informative.	.556	3.47	.873	
	News stories contributed by users are relevant to our daily life.	.563	3.35	.912	
	Generally, I think news stories on this platform are important.	.587	3.18	.896	
Quality	Comments make the news stories clear enough.	.747	3.18	.935	.79
	Good news stories are always highly rated by peers.	.657	3.52	.866	
	News stories are comprehensive on this social media platform.	.545	3.11	.957	
	News stories are always well-written on this platform.	.524	2.83	.913	
	Comments left by other users can justify the objectivity of news.	.556	3.07	1.033	
Credibility	On this social media platform, news stories generated by users are objective.	.682	2.86	.910	.75
	These news stories are unbiased.	.776	2.47	.866	
	I think news stories provided by social media are trustworthy.	.712	2.76	.890	

- “Liking/relevance” describes the overall affective reaction of news readers to news content, as well as the degree to which news stories in social media are relevant to users’ information needs. There are seven items to measure news liking/relevance, and are summed and averaged to represent the value of news liking/relevance. The mean of the index is 3.38 (SD = 0.64, Cronbach α = 0.85).

Higher scores mean that users' perceive news stories in social media to be more relevant and/or well-liked.

- “Quality” signifies the overall value of a news story. Usually, a good news story is well-written and is clear enough for readers to comprehend. Adjectival items like clear, comprehensive, highly-rated are used as descriptors of news quality. Five items are utilized to measure users' evaluation of news quality in social media. The mean is 3.14 (SD = 0.69, Cronbach α = 0.79).
- “Credibility” refers to users' overall evaluation of the reliability of news stories. It is characterized by descriptors as objective, unbiased, and trustworthy. Based on users evaluations, the mean of news credibility in social media is 2.70 (SD = 0.72, Cronbach α = 0.75).

Thirdly, opinion leadership is measured by respondents' perceptions of their position within the social media community. That is, whether they were opinion leaders or opinion followers (Flynn, Goldsmith, & Eastman, 1996; Shoham & Ruvio, 2008) (refer to Table 4.4).

- “Opinion leader” refers to the extent to which social media users perceive themselves to be capable of providing useful information and influencing other users' information processing behavior. They may feel responsible for transmitting information for the benefit of other users, attempting to make themselves as outlets for others to process news stories. There are four items used to measure the opinion leader construct, and are summed and averaged to represent its value. The mean of the index is 2.80 (SD = 0.87, Cronbach α = 0.81). Higher scores indicate that users are more likely to perceive themselves as opinion leaders in social media.
- “Opinion follower” refers to users' tendency to seek news stories from their connections who may share similar interests in terms of news topics and feel that their information behavior is determined by other influential users. Opinion followers are targeted by message senders/opinion leaders. Being influenced by opinion leaders, they may feel reluctant to actively share news stories but act as a message receiver. The mean of the opinion follower perception is 3.11 (SD = 0.81, Cronbach α = 0.80).

Table 4.4 Measurement and Factor Analysis of Opinion Leadership

Opinion Leadership	Scale items	Factor loadings	Mean	Std. deviation	α
Opinion leader	Other people would like to visit my profile to access news stories.	.748	2.71	.992	.81
	The news stories I share on this platform seem to be influential to other people.	.776	2.79	.987	
	People with whom I connect on this social media platform share news based on what I have contributed and shared.	.647	2.88	1.039	
	I like to rate and contribute to the comments after news stories.	.536	2.98	1.111	
Opinion follower	These opinion leaders are reliable and trustworthy.	.581	2.83	.903	.80
	News stories shared by opinion leaders are attractive.	.685	3.29	.944	
	When I want to read news, I'd like to access what influential people have contributed and shared.	.757	3.33	1.119	
	When I want to share news, I tend to access what influential people have contributed and shared.	.661	3.00	1.142	

Lastly, characteristics of the diffusion network are manifested by homophily and tie strength. Here, eight question items (one was deleted due to low loadings) were adapted from prior research (McCroskey, McCroskey, & Richmond, 2005; Steffes & Burgee, 2009) (refer to Table 4.5).

- “Homophily” is measured by respondents’ evaluation of the degree to which they feel that users in their online community are similar to each other, in terms of social backgrounds, news interests, attitudes towards news events, and so on. If they find other users are similar, respondents are more likely to interact with each other. Thus in social media platforms, a higher frequency of news sharing may occur within homogeneous networks. 4 items are used to measure the degree to which users perceived their diffusion networks are homogeneous. The mean index for homophily is 2.99 (SD = 0.83, Cronbach α = 0.85). Higher scores indicate that a higher perception of similarity in terms of background, interest, and attitudes.
- “Tie strength” is utilized to measure perceived closeness of the relationships among users on social media platforms. Specifically, it is represented by the amount of interaction, emotional intensity, and perceived intimacy, which have been identified as indications of the strength of relationships (Kang, 2009).

Four items are used to measure the strength of ties. The mean of the index is 3.34 (SD = 0.77, Cronbach α = 0.75).

Table 4.5 Measurement and Factor Analysis of Homophily and Tie Strength

Diffusion Networks	Scale items	Factor loadings	Mean	Std. deviation	α
Homophily	Most of people I connect with on this platform have a lot in common with me.	.724	3.19	.986	.85
	Their backgrounds are similar to mine.	.704	2.96	.991	
	Their thoughts and interests are similar to mine.	.857	2.96	.951	
	They express attitudes similar to mine	.808	2.89	.971	
Tie strength	I am in close contact with the people who are in my online social network.	.725	3.09	.991	.75
	I have good relationships with people who are in my online social network.	.735	3.39	.956	
	I enjoy reading news stories shared by the people who are in my online social network.	.548	3.53	.899	

After identifying the independent variables involved in the present study, the correlations among them were examined for multicollinearity (refer to Table 4.6 and Table 4.7). The results showed there were no high correlations (0.7 or above) among the independent variables. Meanwhile, the VIF is all below 5 and the Tolerance statistics is all above 0.1. These indicate that multicollinearity will not be an issue.

Table 4.6 Correlations among Independent Variables (Pearson)

Table 4.6 Correlations among Independent Variables (Pearson)

	Information learning	Enjoyment	Socializing	Self status	Liking/relevance	Quality	Credibility	Opinion leader	Opinion follower	Homophily	Tie strength
Information learning	1										
Enjoyment	.445**	1									
Socializing	.660**	.504**	1								
Self status	.454**	.534**	.479**	1							
Liking/relevance	.502**	.346**	.489**	.442**	1						
Quality	.416**	.336**	.470**	.454**	.623**	1					
Credibility	.281**	.103	.213**	.287**	.367**	.450**	1				
Opinion leader	.495**	.339**	.452**	.333**	.341**	.356**	.261**	1			
Opinion follower	.502**	.228**	.428**	.363**	.494**	.424**	.316**	.463**	1		
Homophily	.295**	.287**	.295**	.204**	.333**	.291**	.343**	.337**	.358**	1	
Tie strength	.342**	.323**	.388**	.305**	.387**	.426**	.339**	.426**	.331**	.464**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed).

Table 4.7 VIF and Tolerance Statistics of Independent Variables

	Tolerance	VIF		Tolerance	VIF
Information learning	0.505	1.980	Opinion leader	0.628	1.594
Socializing	0.506	1.978	Opinion follower	0.596	1.678
Enjoyment	0.578	1.731	Homopihly	0.689	1.451
Status Seeking	0.572	1.750	Tie strength	0.637	1.569
Liking/relevance	0.498	2.009	Credibility	0.705	1.418
Quality	0.498	2.009			

As the present research examines users' news sharing, the dependent variable was user's news sharing in social media. The three questions items measuring news sharing were adapted from previous studies (Bock et al., 2005; Lee et al., 2010). Respondents were asked to indicate how likely they intended to share news in social media in the future. These items were measured by a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A similar factor analysis was executed (see Table 4.8). All items were loaded together as one variable, named "news sharing" ($M = 3.15$, $SD = .99$, Cronbach $\alpha = 0.93$).

Table 4.8 Factor Analysis for News Sharing

Construct	Scale items	Factor loadings	Mean	Std. deviation	α
News sharing	Intend to share news stories in social media in the future.	.937	3.19	1.044	.93
	Expect to share news stories contributed by other users.	.938	3.22	1.037	
	Plan to share news stories in social media regularly.	.936	3.05	1.103	

Next, hierarchical regression was performed to analyze what factors were significantly associated with users' news sharing in social media. Hierarchical regression is able to partition the total variance into several blocks, whereby the

contributions of each block can be separated and manifested (Petrocelli, 2003). Specifically, the independent variables were entered in three variable blocks. Because the present study attempted to uncover the extent the variables derived from the diffusion of innovations theory may complement the explanation accounted for by perceived gratifications, the perceived gratifications were entered as the first block. They were followed by news attributes as the second block, and opinion leadership and characteristics of diffusion networks as the third block. Statistical significance for all tests was set at the .05 level.

Results

Descriptive Statistics

Descriptive statistics concerning respondents' social media usage is presented in Figure 4.1. Specifically, 93.5% (n=290) of the respondents indicated they had at least one social networking account (e.g., Facebook). Further, 48.1% (n=149) reported they accessed to video or picture sharing platforms (e.g., Flickr, YouTube), while 39.7% (n=123) had a blog profile, and 33.5% (n=104) had an account in micro-blogging sites (e.g., Twitter).

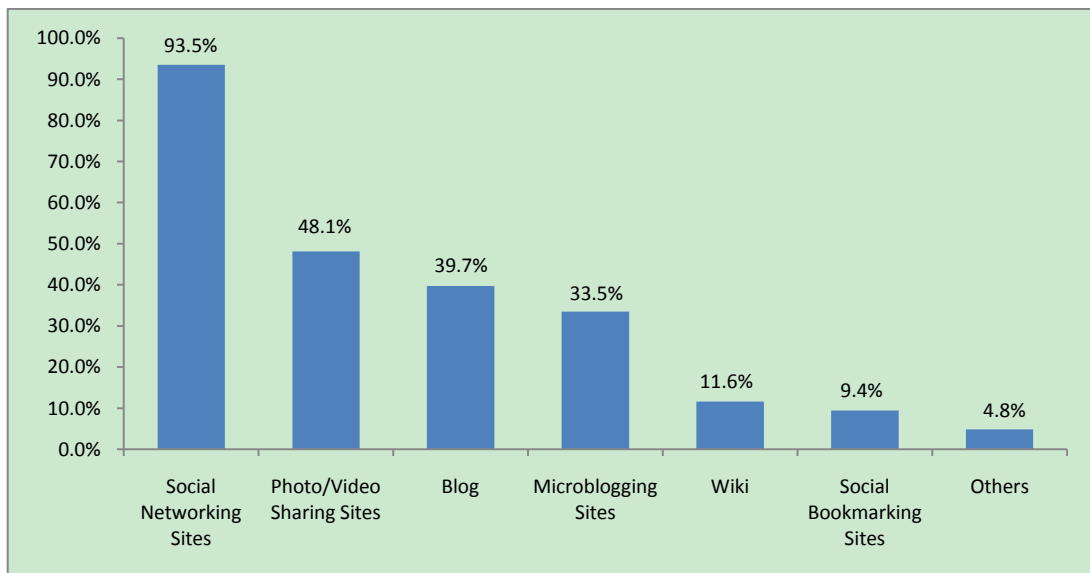


Figure 4.1 Social Media Subscribed by Respondents (N=310)

The respondents were also asked to indicate one social media platform in which they primarily used to access news stories (Figure 4.2). The results showed that

59% (n=183) of the respondents ranked Facebook as their favorite social media platform for news access, followed by Twitter (11.3%, n=35) and Renren (4.5%, n=14) (a Chinese social networking website like Facebook).

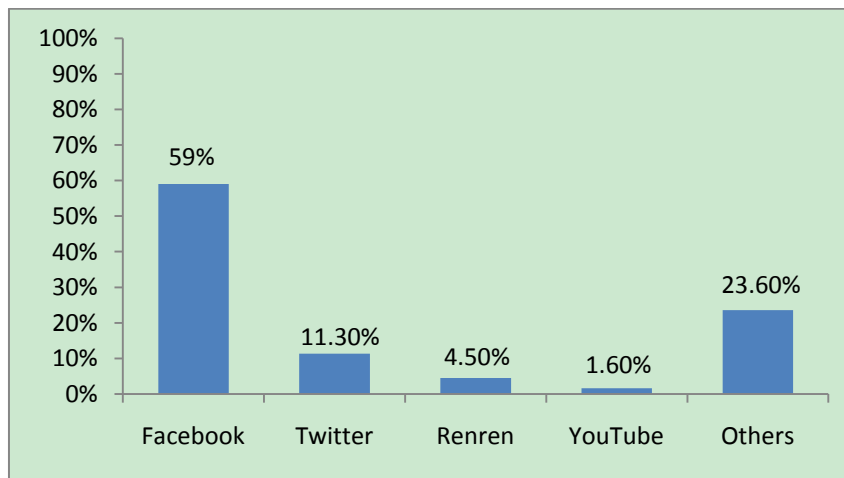


Figure 4.2 Social Media Accessed as News Sources (N=310)

Respondents were also asked to choose their favorite news topics for reading and sharing separately in social media. There were 19 categories of news stories presented as options, adapted from previous research concerning classification of news stories (Thelwall, Byrne, & Goody, 2007; Wu & Bechtel, 2002). Among various types of news stories, respondents were more likely to read news stories concerning entertainment, politics, science and technology, economics and business, and tourism (refer to Figure 4.3). In terms of sharing, entertainment, science and technology, politics, education, and tourism were ranked as the favorite news topics to share in social media (refer to Figure 4.4).

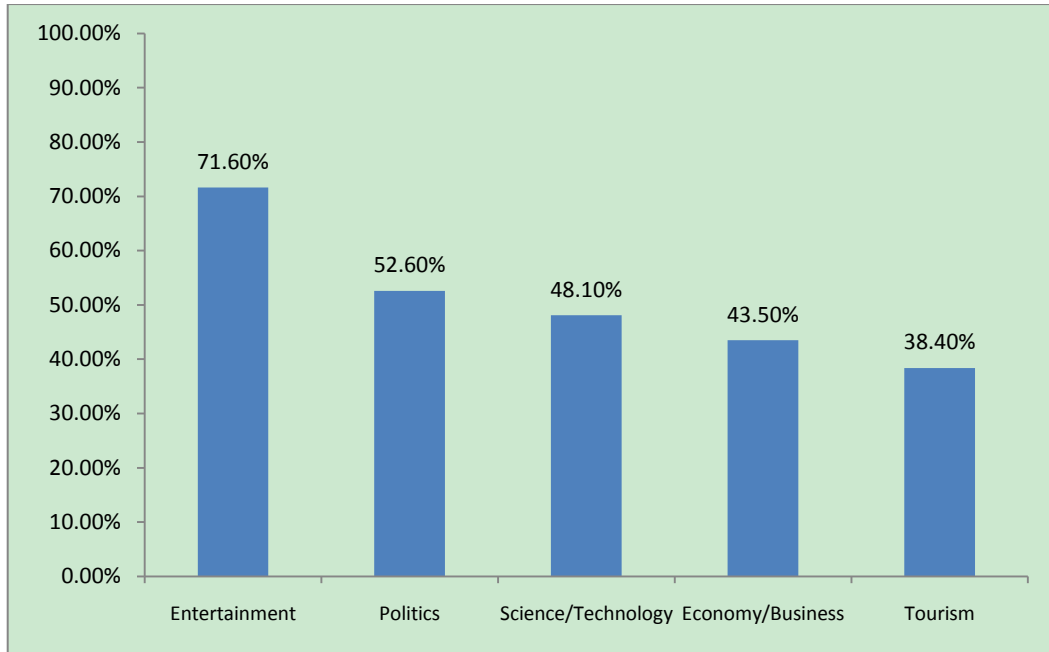


Figure 4.3 Favorite News Topics to Read in Social Media (N=310)

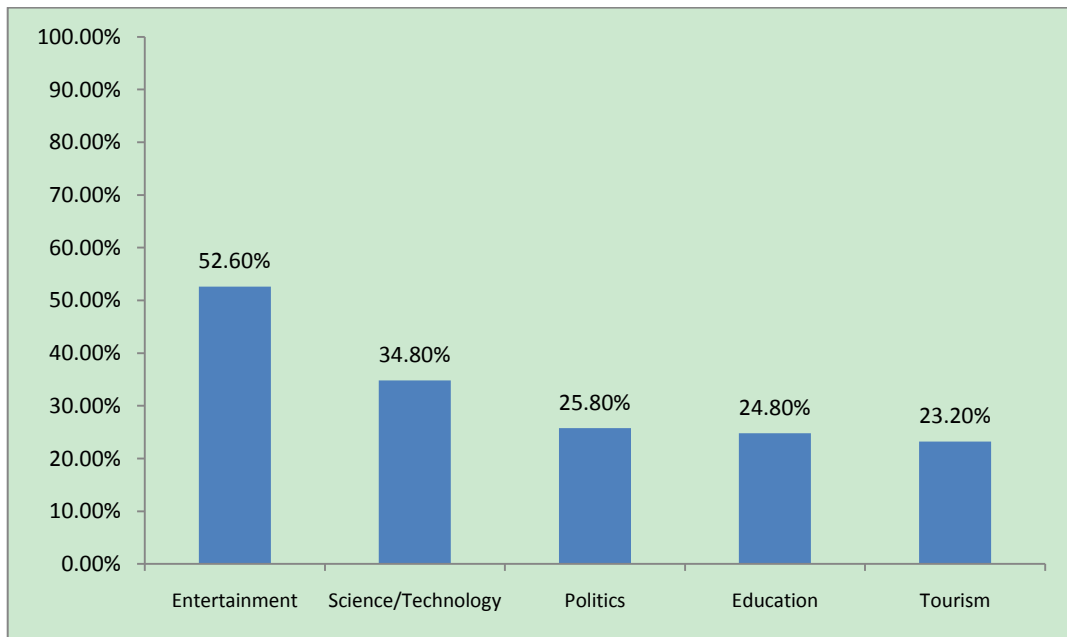


Figure 4.4 Favorite News Topics to Share in Social Media (N=310)

Regression Analysis

The results of the hierarchical regression analysis are presented in Table 4.9 (the full models are found in Appendix C). Collectively, when all the variables were

entered, they accounted for 56% of the variance in predicting users' news sharing in social media (Adjusted $R^2 = .56$, $F = 36.36$, $p < .001$). This indicated that the proposed conceptual model was theoretically supported by the analysis.

Table 4.9 Hierarchical Regression Analysis (N=310)

Independent Variables	Standardized Beta	t-values
First block		
Information learning	.249	4.427***
Enjoyment	.084	1.530
Socializing	.290	4.977***
Status seeking	.186	3.414**
Multiple R	.654***	
Adjusted R^2	.420***	
Second block		
Liking/ Relevance	.179	3.051**
Quality	.070	1.177
Credibility	-.002	-.039
Multiple R	.678***	
Adjusted R^2	.448***	
Changed in Adjusted R^2	.028***	
Third block		
Opinion leader	.337	7.044***
Opinion follower	.006	.129
Homophily	.014	.317
Tie strength	.148	3.107**
Multiple R	.759***	
Adjusted R^2	.560***	
Changed in Adjusted R^2	.112***	

Note: a. dependent variable is "users' news sharing".

b. * $p < .05$, ** $p < .01$, *** $p < .001$

In Block 1, gratification factors for information learning ($\beta = .249$, $p < .001$), socializing ($\beta = .290$, $p < .001$), and status seeking ($\beta = .186$, $p < .05$) showed significant positive relationships with users' news sharing in social media, explaining 42% of the variance (Adjusted $R^2 = .420$, $F = 56.40$, $p < .001$). Therefore, hypotheses 1a, 1c, 1d were supported. In particular, the socializing gratification showed the most impact on users' news sharing. That is, compared to all the other variables in the model, it accounted for the most variance in news sharing. Users thus regard relationship maintenance and development as the strongest motivation for sharing news in social media. The second strongest predictor of users' news sharing in social media was the information learning gratification. This indicates that users expect to learn new information from news sharing. Next, status seeking was identified to be positively associated with users' news sharing. This finding suggests that users who share news in social media anticipate to establishing personal status among other users. Contrary to expectations, no significant relationship existed between enjoyment and news sharing ($\beta = .084$, $p = .127$). This indicates that users of social media do not consider sharing news to be entertaining.

In Block 2, news attributes were added into the regression analysis. The results showed that news liking/relevance ($\beta = .179$, $p < .01$) was a significant predictor of users' news sharing in social media. Thus hypothesis 2b/2d was confirmed. This indicates that news stories that are liked by users, and/or relevant to the information needs are more likely to be shared on social media platforms. However, other features, such as credibility and quality, showed no significant relationships with users' news sharing. In addition, the significances of the gratification factors remained the same. Socializing was still the most important predictor of users' news sharing in social media, followed by information learning and status seeking. Collectively, gratification factors and news attributes explained 44.8% of the variance in news sharing (Adjusted $R^2 = .448$, $F = 36.42$, $p < .001$), with a slight increase (2.8%) in adjusted R^2 .

Lastly, factors concerning opinion leadership and characteristics of the diffusion network, (i.e., opinion leader, opinion follower, homophily, and tie strength) were integrated as Block 3. The entire model was also found to be significant (Adjusted $R^2 = .560$, $F = 36.36$, $p < .001$), with a significant increase (14%) in adjusted R^2 compared to Block 1. This demonstrates that opinion leadership and characteristics of the diffusion network contribute to an increase in the explanatory power of users'

news sharing in social media. Specifically, the results showed that users who perceive themselves as opinion leaders ($\beta = .337, p < .001$) are more likely to share news. In contrast, opinion followers did not significantly influence users' news sharing in social media. Therefore, hypotheses 3a and 3b were supported.

Regarding characteristics of the diffusion network, the results show that users with strong ties are more inclined to share news ($\beta = .148, p < .01$) in social media platforms. Thus, hypothesis 4b was supported. However, homophily was found not to be significantly related to users' news sharing. It is noted that in Block 3 in which gratification factors, news attributes, characteristics of diffusion network, and opinion leadership are integrated, the strongest predictors are opinion leader ($\beta = .337, p < .001$), news liking/relevance ($\beta = .170, p < .01$), and socializing ($\beta = .153, p < .01$). These are followed by gratification factors and characteristics of diffusion networks, such as tie strength ($\beta = .148, p < .01$) and status seeking ($\beta = .127, p < .05$). That is, the significance of gratification factors decreased after the variables from the diffusion of innovations theory were integrated into the explanatory model. This further demonstrates that the diffusion of innovations theory can complement the uses and gratifications theory when explaining users' news sharing in social media. The results of the testing of the hypotheses are summarized in Table 4.10.

Table 4.10 Results of Hypotheses Testing

Hypotheses	Result
H1a: Perceived gratification of information learning is positively associated with users' news sharing in social media.	Supported
H1b: Perceived gratification of enjoyment is positively associated with users' news sharing in social media.	Not supported
H1c: Perceived gratification of socializing is positively associated with users' news sharing in social media.	Supported
H1d: Perceived gratification of status seeking positively associated with users' news sharing in social media.	Supported
H2a: Perceived credibility of news is negatively associated with users' news sharing in social media.	Not supported
H2b/2d: Perceived liking/relevance of news is positively associated with users' news sharing in social media.	Supported
H2c: Perceived high quality of news is positively associated with users' news sharing in social media.	Not supported
H3a: Users who tend to be opinion leaders are more likely to share news in social media.	Supported
H3b: Users who tend to be opinion followers are less likely to share news in social media.	Supported
H4a: Users who are in more homogeneous diffusion networks are more likely to share news in social media.	Not supported
H4b: Users who are in stronger tie diffusion networks are more likely to share news in social media.	Supported

Discussion

The results of the present study suggest that sharing news via social media is a popular activity. By integrating the uses and gratification theory and diffusion of innovations theory, this research has identified several clusters of factors that are significantly associated with users' news sharing in social media. Specifically, the present study found that perceived gratifications of socializing, status seeking, and information learning are significantly related to users' news sharing in social media. Further, through the lens of the diffusion of innovations theory, the current study investigates parameters such as innovation attributes, opinion leaders as well as followers, and the characteristics of the diffusion networks on users' news sharing in

social media. Results indicate that innovation attributes in terms of news liking/relevance and users who perceive themselves as opinion leaders in social media could exert positive influence on users' news sharing. Further, the present study shows that users connected within strong ties are more inclined to share news stories.

Perceived Gratifications

With regard to perceived gratifications, the most salient factor motivating users to share news in social media is socializing. Socializing is related to people's need for being part of a group and having a sense of belonging (Rubin, 1986). This finding is consistent with previous research concerning motivations underlying people's information sharing behavior in online communities (e.g., Cho, Chen, & Chung, 2010; Lee et al., 2010). Indeed, users would like to participate in online activities if they are motivated by relational development and community interest (Rafaeli & Ariel, 2008; Wasko & Faraj, 2000). Through sharing news stories in online communities, users may feel that they are making contributions to the group and therefore are affiliated with it. In addition, social media has extended an individual's social network to a global scope and facilitate interaction across different societies (Krishnatray et al., 2009). Many social media websites (e.g., YouTube, Twitter) are widely used by people from different countries with a variety of background. Through a variety of activities such as commenting, voting, and tagging, users may identify others who have similar interests in news topics and may then initiate contact with them (Dunne, Lawlor, & Rowley, 2010). Put differently, this study shows that news sharing can be a means to develop and maintain social relationships in social media.

Another important finding from this study is that the perceived gratification of status seeking is also identified as a significant factor in motivating users to share news in social media. This indicates that people consider news sharing as an effective way to promote their status in online communities. This is not surprising because recent studies on social media have showed that people can establish status through commenting and discussing with one another (Dunne, Lawlor, & Rowley, 2010). A similar finding was reported in blog space whereby establishing reputation was regarded as an important incentive for blogging (C. Hsu & Lin, 2008). Status seeking is based on the need to establish one's credibility, self-confidence, and self-esteem (Rubin, 1986). Further, prior research has found that social networks can impact

individuals' need for status attainment (N. Lin, 1999). Here, the current study has confirmed the status-seeking needs of social media users and further found that people attempt to establish their status through sharing news. In social media, news stories shared by individual users are accessible by the whole global community of users who are connected to the social network. If news stories that they share are interesting and can satisfy others' information needs, their status is likely to be enhanced.

In addition, this study finds that news sharing in social media is motivated by the information learning gratification. People with this motive tend to be satisfied by media channels that contain high levels of news coverage and are "amenable to active information-seeking strategies" (Althaus & Tewksbury, 2000; Howard & Corkindale, 2008). In this aspect, social media has advantages in satisfying people's information needs by providing a large quantity of news stories as well as a variety of topics, with millions of users all over the world generating and sharing content everyday (Asur et al., 2011). In addition, social media can help users to effectively access relevant news information, because they are usually connected with others who have similar information preferences (Dunne, Lawlor, & Rowley, 2010; Lerman & Ghosh, 2010). Through collective filtering, users can easily find what they prefer to read within their online social network (Lerman, 2007). Furthermore, while traditional gratification research found that information learning motivated audiences to read news from various channels (Diddi & LaRose, 2006; C. Lin, Salwen, & Abdulla, 2005; Rubin & Perse, 1987), the present study extends such work by identifying this gratification as a significant motive for sharing news in social media. On social media platforms, the news stories a user shares can be automatically recorded in his/her online profile as a private collection. These news records can be retrieved in the future when the need arises. Similar finding was reported in mobile content sharing research (e.g., Ames & Naaman, 2007; Low, Goh, & Lee, 2010) which found that people share content because they anticipate potential information retrieval needs in the future. Here, this study shows that sharing news in social media not only satisfies current information needs, but also may facilitate the fulfillment of future ones.

Unexpectedly, the perceived gratification of enjoyment was not found to be a significant predictor of users' news sharing in social media. This indicates that users do not perceive news sharing as an outlet for fulfilling the enjoyment need. This is different from conclusions suggested by previous studies which found that enjoyment

is an important motivation for people to participate in interactive use of online news (e.g., Diddi & LaRose, 2006; Hujanen & Pietikäinen, 2004). One possible explanation is that news sharing in social media is much more oriented by instrumental use rather than ritualized use. Instrumental use is derived from purpose-oriented intentions, while ritualized use is related to habitual use of media for consuming time and diversion (Rafaeli & Ariel, 2008; Rubin, 1984). Accordingly, enjoyment is on the basis of people's need to conserve mental effort (LaRose & Eastin, 2004). Here, the enjoyment refers to the feeling of pleasure derived from the use of media. As an active information processing process, news sharing tends to be subjected to a high level of engagement and reaction, which is not congruent with users who are seeking enjoyment. These users may turn to alternative options provided by social media which requires less mental effort, such as watching videos and playing games, to gratify their enjoyment needs.

Taken together, it is noted that news sharing in social media has become a social experience (Purcell et al., 2010). Prior to the advent of social media, news was primarily consumed by reading newspapers or news websites. Readers did so to seek information, pass time, and/or escape from stress (Diddi & LaRose, 2006; C. Lin, Salwen, & Abdulla, 2005). With social media, however, people are now not only able to access news easily, but they may also share news simultaneously within their online social networks (Lerman, 2007). Specifically, perceived gratifications such as socializing, seeking status, and information learning are driving people to share news in social media. This means that people's experiences with online news have been transformed from a personal activity to an interpersonal one driven by social media. This is one of the paramount findings revealed by the present study.

In addition to the psychological and social needs motivating news sharing in social media, the present study further extends current research by integrating influential factors in the aspects of news attributes, opinion leadership, and diffusion network characteristics, which are drawn from the diffusion of innovations theory. It should be noted that integrating the diffusion of innovations theory with the uses and gratification theory has significantly improve the explanatory power of the entire conceptual model.

News Attributes

In accordance with Roger's (2003) diffusion model, this research also reveals that news attributes can exert influence on users' news sharing in social media. Specifically, news liking/relevance is found to be an influential determinant of sharing news in social media. The perception of liking is associated with emotional arousal which can increase the intensity of affective reactions (Vettehen, Nuijten, & Peeters, 2008). Such affective reactions are characterized by adjectives such as pleasing, happy, interesting, or boring, disturbing, dull (Sundar, 1999). Accordingly, a positive affective reaction indicates a story is liked by users. As users tend to contribute to the community with the expectation of reciprocity (Rafaeli & Ariel, 2008), they are inclined to share news stories that they like.

Regarding the perception of relevance, users' judgments in terms of their situation and goals, interest, knowledge level, beliefs, and other criteria are involved (Barry, 1994). In social media, when users perceive that news stories they read are relevant to the interest of the online community and the information need of other connected members, they tend to share those news stories on a basis of altruism and social affiliation (Peddibhotla & Subramani, 2007). By sharing content that is liked/relevant, a user expresses his/her altruistic concern for others (Rafaeli & Ariel, 2008). Users who share liked/relevant news stories may expect to save others' time or inform others interesting or relevant news stories, which repays themselves with the positive feeling of helping others (Cho, Chen, & Chung, 2010). This is supposed to cultivate a "gift culture" in online social networks (Wang & Fesenmaier, 2003). In addition, as the shared news stories may be relevant to the information needs of other connected members, the news sharing behavior may enhance the sharers' status and reputation in the online community, which is manifested by the status seeking gratification identified in the present study.

However, news quality is not regarded as an important factor that impact users' news sharing in social media. One possible explanation is that there are alternative online sources (e.g. CNN.com, BBC.com) that provide quality news stories for social media users. Further, some news stories in social media are contributed by non-professional reporters. Take the Japanese tsunami for example. Relevant videos shared on YouTube were not of good quality but were still widely shared on this social media platform. In this case, focus is transferred from news quality to other news criteria,

such as relevance. Very importantly, the results indicate that for social media users, their news sharing depends on whether a news story is interesting or relevant rather than the quality of the news story. From the perspective of journalists, news quality is paramount and critical, for it provides information for citizens to discharge their democratic responsibility (Prior, 2003). However, the rise of soft news and market-driven journalism blurs the line between news and entertainment, and this has been criticized as diluting news quality (Zaller, 2003). This concern is to some extent confirmed by the present study. For users in social media, news is utilized for socializing and interacting with others, whereas the quality of news is not important. It seems that social media is becoming the virtual assembly whereby people gather to discuss all manner of news, as long as such news facilitates social interaction.

Contrary to expectations, the relationship between news credibility and users' news sharing was not significant. That is, news credibility has no significant influence on users' news sharing in social media. This may be due to the lack of editorial and gate-keeping rules for news stories in the Internet, whereby there are few means for users to verify the credibility of news content and news sources (Abdulla et al., 2005). As such, users may become indifferent about the credibility of online news. Another explanation is that news stories are interleaved with users' comments and discussions, and this may confuse judgments of news credibility. In social media, users are expected to utilize news stories they share to initiate discussions with others. During this process, information and opinions from diverse sources may be added along with the original news stories. However, the increased amount of interpersonal communication may undermine users' perceived credibility of the original news story (Kioussis, 2001). As a result, similar to the issue of news quality, users may disregard the credibility of news, but put more value on the capability of news to initiate interactions and socialize with one another.

Opinion Leadership

The results indicate that opinion leadership can exert influence on the news sharing process. Opinion leadership is manifested in the communication process by a two-step flow, whereby opinion leaders first acquire information from mass media and then pass it on to their followers (Rogers, 2003). Findings from this study reveal that this mechanism of information flow may also exist in the context of social media.

Specifically, the findings suggest that users who perceive themselves as opinion leaders are more likely to share news in social media. Indeed, people who perceive themselves as opinion leaders tend to have more knowledge about certain topics and be more involved in information sharing (Eliashberg & Shugan, 1997; Lyons & Henderson, 2005). These characteristics can be extended to explain opinion leaders' behavior in the social media context. Here, opinion leaders may have a high level of knowledge and experience in identifying what kinds of news stories followers are interested in. Perceiving themselves as experts, opinion leaders have a sense of responsibility and altruism to transmit useful information for others (C. Hsu & Lin, 2008). In addition, past studies have reported that opinion leaders are conscious of their "appearance" and are socially active (Shoham & Ruvio, 2008). More importantly, opinion leaders need to be publicly individuated (Chan & Misra, 1990). That is, opinion leaders desire to differentiate from others and aim to stand out in a group. By sharing news stories to their followers, opinion leaders aim at exhibiting their innovativeness (Girardi, Soutar, & Ward, 2005). They attempt to highlight their social positions in the community, which may be fulfilled by sharing news. Once established as important sources for news stories, it is likely that opinion leaders may feel compelled to be socially responsible and be more engaged in news sharing.

In parallel with opinion leaders, opinion followers are also involved in the process of information exchange, whereby opinion leaders play the role of particular information suppliers while opinion followers are demanders (Bertrandias & Goldsmith, 2006). Compared to opinion leaders, the results indicate that opinion followers have no significant influence on users' news sharing in social media. This finding is consistent with prior studies concerning other type of innovation diffusion (e.g., Shoham & Ruvio, 2008). Specifically, past research has reported that opinion followers do not want to feel unique in a social group (Bertrandias & Goldsmith, 2006) and opinion followers are also found to be unrelated to innovativeness (Girardi, Soutar, & Ward, 2005). As news sharing is typically a social and relatively innovative phenomenon, opinion followers are reluctant to stand out and draw attention to themselves. Hence, they may be inclined to receive news stories from others and avoid participating into the news sharing process.

Diffusion Networks

Regarding the influence of diffusion networks, the present study finds that users who are in strong tie networks are more likely to share news stories. This indicates that people are inclined to share news with others who share close relationships. This finding is consistent with previous studies focusing on face-to-face communication, which found that information exchange is more likely to take place along those with strong ties (Brown & Reingen, 1987; Thomas-Hunt, Ogden, & Neale, 2003). People are supposed to share similar perspectives and attitudes with strong tie connections (Thomas-Hunt, Ogden, & Neale, 2003). Through frequent information exchanges, communication partners may establish some communication norms and histories which help to strengthen their relationships. Conversely, the more strongly two individuals are connected with each other, the more time and effort they are willing to spend on behalf of each other (e.g. information exchange) (Reagans & McEvily, 2003). In addition, in online social networks people who share content expect their actions to be reciprocated. (Cho, Chen, & Chung, 2010; Rafaeli & Ariel, 2008). This implies that sharing behavior is more likely to take place among strong tie networks (Stephen & Lehmann, 2009) since users trust each other more and hence it is more likely for their actions to be reciprocated in such a network than a network with weak ties. Therefore, in social media, users connected with strong ties tend to actively share news for one another, with the expectation of reciprocity and relationship enhancement.

Contrary to expectation, homophily was not found to exert an influence on users' news sharing in social media. This means that users are not concerned whether community members are similar when they share news in their networks. In fact, some recent studies have explained that users choose to be in networks with heterogeneous users because they want to access different ideas and perspectives (Chu, 2011). This allows information to transmit from one distinct subgroup to another in the broader social system (Brown & Reingen, 1987). Another possibility is the lack of documented measurement of homophily and reliable cues to assess similarity within an online (Wright, 2000). Due to the limited demographics disclosed by users, there may be few cues that allow users to judge the degree of homophily in the online environment. Thus users may not be able to confirm the impact of homophily in social media.

In sum, on the basis of uses and gratifications theory and diffusion of innovations theory, the present research validated the proposed model in explaining users' news sharing in social media. Specifically, it was identified that perceived gratifications (i.e., socializing, status seeking and information learning), news attributes (i.e., news liking/relevance), opinion leadership (i.e., opinion leaders), and characteristics of diffusion networks (i.e., tie strength), can exert significant influence on users' news sharing in social media. In particular, opinion leadership (a factor from diffusion of innovations theory) showed a stronger impact than the motivational factors derived from the uses and gratification theory (i.e., socializing, status seeking and information learning). The results reinforce that news sharing in social media is a social event and individuals are driven more by perceptions on how they are viewed in the networks (i.e. opinion leaders) than by their self-motivating factors. In sum, news sharing in social media is a social experience of interaction and participation in the online community.

While the use of subjective data to measure motivational factors from the uses and gratifications perspective is appropriate, there are concerns that the subjective data may not accurately capture the network environmental factors derived from diffusion of innovations theory, such as news attributes, opinion leadership, and characteristics of diffusion networks. To address the limitations, Study 2 utilized secondary data harvested from social media platforms to further validate the proposed model, specifically focusing on the part based on diffusion of innovations theory.

CHAPTER FIVE STUDY 2

Study 2 attempts to achieve the second research objective as well as address the limitations of Study 1. Specifically, through analyzing the secondary data from social media platforms, Study 2 attempts to address the following research question: *How do characteristics of diffusion networks, opinion leadership, and news attributes, impact the news sharing in social media?*

Two platforms were selected for Study 2. Twitter was selected as a benchmarking platform to provide insights on general information sharing and the network structures that evolve from online sharing behavior. Twitter is suitable as a benchmark platform because the informational content spread in Twitter is time sensitive and shares common attributes with news. Also, the social network of users in Twitter is ideal for studying opinion leadership and the influence of networks on informational content sharing.

Digg was selected as a news platform to examine news sharing in social media for the following reasons. First, Digg was used for sharing news in the Internet. It is a popular social news aggregator with over 3 million registered users (Lerman & Ghosh, 2010). Second, news items were well documented in the website, along with users' information. The content is suitable for the analysis of the present research.

In this study, secondary data were collected from both platforms. The secondary data included the user information, the shared content, as well as the network structures whereby the informational content was shared. The data was analysed using social network analysis. Through the methods and indexes developed by social network analysis, the present study managed to measure the constructs proposed in the conceptual model (including opinion leadership, homophily, tie strength, news liking) and further examine how they were associated with users' news sharing in social media. Thus, in the next section the method of social network analysis is elaborated, followed by the two studies in Twitter and Digg.

A Social Network Approach

In this section, the concepts discussed in previous chapters are revisited from a social network approach. Essentially, news is shared through relations among people. Thus, the present study applies social network analysis to examine how relations and structures in the social media online environment have influence on news sharing. This

is to complements the data collected via survey which focuses on individuals' characteristics and perceptions.

Social network analysis is an interdisciplinary methodology developed mainly by sociologists, and further collaborated with mathematics, statistics, and computing that leads to a rapid development of formal analyzing techniques for other disciplines (Scott, 2000). It focuses on the analysis of relationships that connect individuals (Hansen et al., 2009). It is based on the assumption of the importance of network structures that can determine individuals' behavior and outcomes. Social network analysis is a theoretical perspective on how social structures of networks are form based on the interactions of individual actors, and a set of analytical tools to study the interactions, network structures and relationships that evolve from the networks (Wasserman & Scott, 1994).

In the traditional communication context, the structure of social networks was not directly visible but had to be inferred by individuals' self-reports on their relationships and flow of information (Armitage & Conner, 2001; Lerman & Ghosh, 2010). By contrast, social media has given researchers access to massive quantities of data which provides a rich source for studying individual behavior, the structure of networks and the flow of information (Lerman & Ghosh, 2010). Indeed, social life has moved online due to the popularity of social media where people now interact with each other. The interactions leave behind complex records of people's social behavior and relationships, which are invisible in the traditional communication context (e.g., face to face communication). Hence, social media are appropriate platforms for studying the influence of social networks on users' sharing behavior.

From the perspective of social networks, society is regarded as a collection of ties among a population whereby the relationships among people are the building blocks of the social world (Hansen, Shneiderman, & Smith, 2010). Once the relationships are established, a graph of the communication structure can be drawn to indicate information diffusion networks of the online community (refer to Figure 5.1). In the graph, a node represents an individual user in the network. The links connecting nodes represent the relationships between two users. Such links among users determine the flow of information and hence indicate a user's influence on others (Cha et al., 2010).

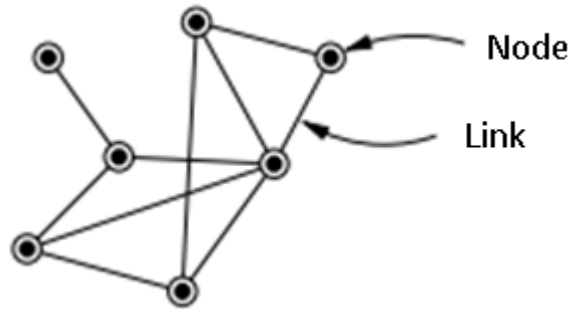


Figure 5.1 A Graph of Social Network

Social network analysis focuses on the relationships and creates measurements to describe the location of each person or entity within the structure of all relationships in the network. Indeed, social network analysis has developed a mathematical and graphical language that can highlight important people, events, and subgroups, including opinion leadership, homophily, and tie strength (De Nooy, Mrvar, & Batagelj, 2005). Here in this research, these three constructs (i.e., opinion leadership, homophily, and tie strength) will be examined from the perspective of social network analysis.

Opinion Leadership

An actor's position in a network affects information flow on the social network (Mori, Sugiyama, & Matsuo, 2005). Social network analysis has contributed important insights about individuals' power and influence. Perhaps most importantly, the network approach emphasizes that individual influence is inherently relational (De Nooy, Mrvar, & Batagelj, 2005). An individual does not have influence in the abstract, but they have influence because they can impact others. Because influence is a consequence of patterns of relations, the amount of power of influence in social structures can vary (De Nooy, Mrvar, & Batagelj, 2005). This concept is measured by centrality in social network analysis which can indicate how individuals become influential through the relationships that they build (Valente, 1995).

There are several ways to measure individuals' centrality (Mori, Sugiyama, & Matsuo, 2005). The simplest measure is to count the number of others with whom an individual maintains relations. This measure is called degree centrality. The more connections one has, the more influence he/she has. They can increase the speed of the information flow once they participate in the sharing process. However, it is possible

that a person with fewer connections might be more “important” than someone with more connections. This results into other measurements of centrality. Another measure is closeness centrality, which calculates the distance from each individual in the network to every other individual based on connections among all network members. Central individuals mean to be closer to all others. In other words, the “distances” through which the user reaches to other users are shorter. As a result, the information shared by such users is more likely to spread to a larger scope within the same time. In addition, some are important because they bridge across otherwise separated groups of the network. This idea leads to the third measurement of centrality, betweenness. Betweenness centrality examines the extent to which information must pass through them to get to others. If the betweenness of an individual is high, he/she frequently acts as a local bridge that connects to others outside a group. Without them, different subgroups may disconnect. Thus, they always act as the brokers who transmit innovative information between different subgroups. Compared to degree centrality, the calculations of closeness centrality and betweenness centrality are more complicated.

In social networks, individuals may attain influence with their connections and form “core groups” by sharing information (Kleiner, 2003). For instance, in a social network, people who receive many connections are considered to be prestigious. Such individuals are viewed as opinion leaders and exert influence on the innovation diffusion process within their networks (Rogers, 2003). They have been identified in various social contexts, such as marketplaces (Feick & Price, 1987), organizations (Smith, 2005), and fashion (Bertrandias & Goldsmith, 2006). The effects of opinion leadership has been well-documented in the online environment (e.g. online word-of-mouth, online marketing) (Chu & Kim, 2011; Kwok & Gao, 2004; Lyons & Henderson, 2005). Opinion leadership has been explored through the measurement of centrality in social media (Xu et al., 2014). As discussed above, the measurement of centrality captures how important, or central, a person is within the network based on some objective criteria (e.g., degree, closeness, betweenness). By identifying such important persons as opinion leaders, the present study attempts to reveal how they may influence information sharing or news sharing in the networks.

Homophily

The principle of homophily is that similarity of individuals (e.g., demographic, behavioural, intrapersonal characteristics) results into connections (McPherson, Smith-Lovin, & Cook, 2001). From the perspective of social network analysis, the probability of a tie between two similar nodes is higher in a homogeneous network. As discussed above, people tend to interact with each other in such homogeneous networks, which further influence the information they receive and the attitude they form.

In the study of homophily, a core-periphery pattern was always found within organizations and communities (McPherson, Smith-Lovin, & Cook, 2001). That is, there exists a central group of closely interconnected people while a larger group of people are less densely connected to the core and to each other. Thus, the distance in terms of social characteristics translates into network distance. As a result, some individuals belong to a tightly connected and closed elite while others are isolated from this group. Such differences in the ways that individuals are embedded within a network can exert significant influence on how the individuals see their “society” and how they tend to behave (De Nooy, Mrvar, & Batagelj, 2005).

In the context of news sharing in social media, it is also expected that such core-periphery phenomenon exists. Because of similar interests in terms of news interests, users may form a core-subgroup whereby users are more tightly connected with each other and tend to share more (Ma, Lee, & Goh, 2013). While there are other aspects of similarity (e.g., race, age, background), the present study mainly focuses on the similarity in terms of news interests. The relevant communication cues (e.g., shared information, music, website decoration) in terms of similarity in preferences can help people to perceive similarity of others and develop relationships (Walther, Loh, & Granka, 2005). It is expected shared news may also play such a role in connecting users together in social media.

Tie Strength

In social network analysis, patterns of ties convey different information. Social ties determine the flow of information among people, and how they respond to ongoing events. (Herdagdelen et al., 2013). Usually, similar patterns of ties are associated with similar social role. Individuals are often connected by different types

of affective relations, namely strong or weak ties. Affective relations do not need to be symmetrical (De Nooy, Mrvar, & Batagelj, 2005). The feeling of A towards B may differ from the feeling of B towards A. Therefore, affective ties are usually represented by arcs rather than edges (a line with an arrow as shown in Figure 5.2).

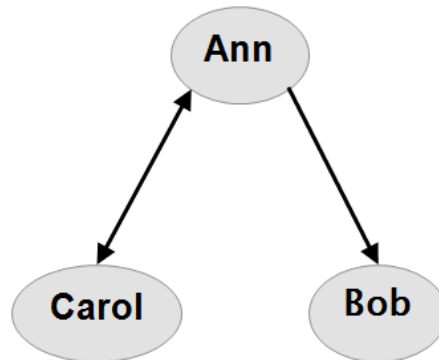


Figure 5.2 Affective Ties

From the perspective of social network analysis, a strong, dense network provides social support and a sense of identity and belonging, for such a network is likely to convey consistent social cues (Morrison, 2002). Individuals in a strong tie network tend to interact more frequently and exchange more information, compared to those in a weak tie relationship (Brown, Broderick, & Lee, 2007). Despite the absence of nonverbal cues, it is clear that social resources such as emotional support, companionship, and a sense of belonging are formed within strong network ties. This is because information is frequently exchanged along with strong ties, which helps to form impression and trust between individuals who do not know each other in the offline context (Walther, Loh, & Granka, 2005).

In the present research, it is proposed that in strong tie networks, users tend to share more information or news with each other. On one hand, strong tie networks provide users with more opportunities to interact with each other. Accordingly, there will be more information flow than weak ties. Similarly, it is expected that strong tie networks will afford more news flow in the context of news sharing in social media. On the other hand, more information or news flow will in turn help users to know each other and build intimate relationships. This will further enforce the strong tie relationships among users.

When analyzing secondary data, one problem is how to identify the strong ties among one's social ties. Indeed, one dimension of the strength of a tie is reciprocal service (Granovetter, 1973). In the social media context, by connecting with each other

users are able to be aware of each other's updates. To certain degree, users tend to share information or news on the behalf of others rather than themselves, in order to provide others the latest information or news. In other words, reciprocal services in social media context are achieved on the basis of reciprocal ties or connections (Hansen, Shneiderman, & Smith, 2010). Thus, the present research attempts to identify strong ties by looking into reciprocal ties connecting users in the network of social media.

Information Sharing in Twitter

As discussed earlier, Twitter was selected as a benchmarking platform to provide insights on general information sharing. Specifically, through analyzing secondary data by social network analysis, it is attempt to see how opinion leadership, tie strength, homophily and news attributes, may exert influence on information sharing in social media.

Twitter

Twitter can be regarded as a conversational microblog (Himmelboim, McCreery, & Smith, 2013). As a social networking website, Twitter is composed of users sending messages (namely tweets) to each other. Messages posted by users are visible to their followers who are the collection of people who subscribe to them. The messages are limited within 140 characters.

In Twitter, a user is identified by a unique user name. When a user account is created, a profile is provided for each user. The reason that makes Twitter attractive for crawling network data is that a variety of metadata is accessible in each user's profile, such as list of friends and followers, location, a brief biography, total number of tweets posted, and last date when the user posted a tweet.

When a user A subscribes to another user B, a friend-follower relationship is established. All the tweets posted by user B will be received by user A, while the converse need not to be true as user B may not subscribe user A. Such asymmetrical relationships provide a directed social network among Twitter users. Twitter imposes a limitation of 2000 friends for each user to subscribe, but there is no limitation for how many followers a user can have. This explains why some celebrities can have millions of followers in Twitter.

In Twitter, users give and receive advice, gather and share information, and meet people (Chen, 2011). People tweet about a range of topics, including events of daily life, original news content, links to news stories, opinions, private message and so on (Sriram et al., 2010). A user can direct a tweet at another user by appending a “@” symbol to the intended user name. Also, a user can highlight a tweet by containing words labelled by “#”, which is referred to as hashtags. By including a hashtag in a tweet, the user puts a key word when the tweets are searched in Twitter. Even though there is no entity regulating the hashtags assigned to tweets, the hashtags for kinds of information are fixed in the Twitter context.

A tweet is a short message from a user to its followers (Sankaranarayanan et al., 2009). Because of the limitation of tweets (140 characters or less per post), the time of creation and consumption of the messages is short and fast. Although the quality of the tweets can be challenged, Twitter has been widely used to spread news information (Kwak et al., 2010). Twitter users either provide original news content (e.g., the Boston Marathon bombing and typhoon Haiyan hits the Philippines) or express their opinions on current news topics (i.e., microblog).

It should be noted that tweets are inherently noisy, as most of which are of little interest to a broad audience (Sankaranarayanan et al., 2009). The challenge of working with such a noisy medium is to identify the content of the tweets. Also, spelling errors, abbreviations of words, and grammatically incorrect language makes it troublesome for researchers to clarify the content of tweets. Nevertheless, tweets are similar to news in terms of immediacy and relevance (Gladney, Shapiro, & Castaldo, 2007). There is very little lag between the time at which an event is first reported in the news media and the time when it is posted on Twitter. However, it tends to be noisy after the news event took place (Sankaranarayanan et al., 2009). Accordingly, tweets can be classified into categories such as news, events, opinions, deals, and private messages, some of which also share the attributes of news information (Sriram et al., 2010). This further blur the line between the news broadcast in traditional media and the information spread in Twitter.

Methodology

Data Collection

Our sample data was collected in March 2013. For benchmarking comparison, 20,000 users were targeted as this sample size was also used by previous studies

related to information sharing and network structures in Twitter (e.g.,Choi & Park, 2014).

The sample users were downloaded by snowball sampling method (Biernacki & Waldorf, 1981). Snowball sampling is useful for sampling of special population segments. It is convenient and the cost is low. However, it is criticized that it may lead to sampling bias and that there is a lack of control over the sampling procedure. Despite the weakness, the present study set some criteria (e.g., number of followers one user can have) when collecting the sample in order to control the sampling procedure. As the present study aims to select a group of users who share information in a network, snowball sampling method is considered to be appropriate and feasible.

The process of snowball sampling is illustrated as follows. First, a user was randomly chosen as a seed node. Next, all the nodes directly connected (both friends and followers) to the seed node were extracted. Here, all nodes directly connected to the seed node are said to be on the first layer. Then, we extracted the second layer by visiting all nodes directly connected to the nodes on the first layer. This process continued until the number of visited nodes reaches a limit determined in advance.

In each user's profile, the user information was harvested, including name, location, number of tweets, number of friends, and number of followers. In particular, number of tweets indicates how many tweets the user has shared. Number of friends means how many others the user has followed. Number of followers means how many others have followed the user. For each user, we harvested the latest 30 tweets, as Twitter put this restriction on the number of tweets available to download. In all 369077 tweets were downloaded. In addition, it was necessary to identify whether each user was active or not. The criteria was that if the latest tweet had been submitted within one month, the user was labelled as active user. The present research applied the same criteria used by Twitter and Facebook. As a result, the sample had 23193 users, including 18565 active users and 4628 inactive users (refer to Table 5.1)

Table 5.1 Sample Demographics (N=23193)

Category	N	No. of followers		No. of friends	
		Mean	Std.	Mean	Std.
Active users	18565	369	2025	251	257
Inactive users	4628	373	453	345	242
Entire sample	23193	372	989	327	248

Analysis Methods

The present research employed the social network analysis software Pajek to analyze the network data to obtain metrics related to characteristics of the social network. Pajek is widely used for large scale network analysis (De Nooy, Mrvar, & Batagelj, 2005). It is especially efficient in analyzing large network data. Specifically, the present study applied Pajek to detect opinion leadership (i.e., centrality), tie strength (i.e., reciprocal ties) as well as homophily (i.e., core-periphery pattern of subgroups) in the social networks. Then SPSS was employed to conduct the statistical tests, t-test and regressions, to verify the hypotheses proposed by the present research. Here, the t-test was applied to examine whether there exists significant differences between groups in terms of number of tweets, number of followers, and number of following. Regression was used to check how factors, derived from opinion leadership, tie strength, and news liking may exert influence on information sharing in Twitter.

Operational Measurements

- Opinion leadership

In the present study, opinion leadership was identified by examining the network structures of individuals. People's social roles can be studied by examining their structural patterns of their social networks (De Nooy, Mrvar, & Batagelj, 2005). From a structural perspective, an individual is considered to be prominent and influential if he/she is particularly having extensive interpersonal network links and a more "central" position compared to others in the network (Rogers, 2003; Wasserman & Scott, 1994). Being consistent with this concept, three indexes of centrality were applied to measure opinion leadership in social media, which are mostly used in social network analysis to capture the individual influence in a network.

Firstly, individuals' centrality can be measured by the number of nominations received, namely degree centrality (Hansen, Shneiderman, & Smith, 2010). Rogers (2003) also argued that individuals with a large numbers of followers may be characterized as opinion leaders who are supposed to influence others' attitude or behavior frequently in a social system.

Secondly, the centrality of an individual in the network can be reflected by closeness centrality. This reflects the importance of an individual's social position by capturing the average distance between an individual and every other person in the network (Hansen, Shneiderman, & Smith, 2010). It is similar to a "distance" score, as people with high closeness centrality scores are far away from other people and have to go through many paths to reach other people in the network. In some cases, the inverse of the average distance to others is used as the measure of closeness centrality. As such, higher values indicate a more central position.

Lastly, the influential position in a network can also be measured by betweenness centrality which reflects how often an individual lies on the shortest path between two other individuals in the network (Hansen, Shneiderman, & Smith, 2010). This can be thought of as a kind of "bridge" score, a measurement of how much removing a person would disrupt the connections between other people in the network.

- Tie strength

Tie strength measures the closeness of the relationships between users and their neighbours. In the online context, the strength of a tie can be measured by checking whether the tie is reciprocal or not (Hansen, Shneiderman, & Smith, 2010). In online social networks, it is possible that the relationship between two users can be one-way (directed) whereby one user follows the other rather than vice versa. If two users include each other as contacts, the link is bidirectional and indicates a reciprocal relationship. It is assumed that a network with many reciprocal ties indicates a set of strong social relationships whereby both people are interested in each other's updates analysis, whereas a network with many one-way ties indicates weak social relationships as in the case of Twitter celebrities (Hansen, Shneiderman, & Smith, 2010). In such reciprocal ties, both users can remain aware of each other's status updates and exchange information directly. Reciprocal ties are often regarded as the most reasonable and reliable approximation of strong ties in social network analysis

(Hansen, Shneiderman, & Smith, 2010). The operationalization is consistent with Granovetter's (1973) study in which asymmetrical contact is regarded as a weak tie and reciprocal contact as a strong tie. Specifically, the proportion of reciprocal ties a user has was used as the measurement of how strongly the user is embedded in his/her network. The higher the coefficient, the more strongly the user is connected with his/her neighbours. Indeed, the measurement of strength of ties is based on the resources and social support grounded in the individuals' social network systems (Huszti, Dávid, & Vajda, 2013). The more reciprocal ties one has, the more mutual services one is likely to obtain from the social network neighbours. Thus, the number of reciprocal ties is supposed to be a reliable predictor of the strength of one's network ties.

- News liking

News liking refers to users' interest in the news stories in social media. Here, the present study considers the ratio of tweets which contain “#” (hashtags) as an indicator of a user's news liking tendency. Indeed, news in social media is regarded as “the information about events and issues that involve more than just your friends or family” (Mitchell, Holcomb, & Page, 2013). Tweets containing hashtags are said to be news topics (Sankaranarayanan et al., 2009), which is supposed to reflect one's degree of news liking tendency.

- Information sharing

In Twitter, data on actual news sharing activity can be collected. Specifically, the user profiles included how many tweets a user has. A tweet is regarded as a record of information sharing. Therefore, the number of tweets was taken into consideration as the measurement of the amount of information sharing.

After identifying the independent and dependent variables involved in the present study, the correlations among them were examined for multicollinearity (refer to Table 5.2). The results showed there were no high correlations (0.7 or above) among the independent variables, indicating that multicollinearity will not be an issue. The mean and standard deviation of independent and dependent variables are presented in Table 5.3.

Table 5.2 Correlations among Independent Variables (Pearson)

	Opinion leader (Degree)	Opinion leader (Closeness)	Opinion leader (Betweenness)	Tie strength	News liking
Opinion leader (Degree)	1				
Opinion leader (Closeness)	0.410**	1			
Opinion leader (Betweenness)	0.427**	0.105**	1		
Tie strength	0.300**	0.612**	0.054**	1	
News liking	-0.310**	0.002**	0.023**	-0.007	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Table 5.3 Mean and Standard Deviation of Variables

	Opinion leader (Degree)	Opinion leader (Closeness)	Opinion leader (Betweenness)	Tie strength	News liking	Information sharing
Mean	0.001	0.194	0.0001	0.517	0.119	5529.13
SD	0.002	0.074	0.001	0.351	0.162	8870.35

Results

By applying the component function in Pajek, some subgroups were found in the network. The present study identified one cohesive group (Group 1) whereby users were tightly connected with each other and others as peripheral group (Group 2). The cohesive subgroup consists of 18049 users, while the total number of users is 23193 in all.

The present study then used a t-test to test the significance of the differences between two groups in terms of number of tweets, number of followers, and number of following. The results are shown in Table 5.4.

Table 5.4 Comparison of Information Sharing Between Groups

	<i>Num. of users</i>	<i>Num. of tweets</i>	<i>Num. of followers</i>	<i>Num. of followings</i>
Group1	18049	5950	353	411
Group2	5144	2705	263	234
ANOVA test	---	999.0***	900.9***	95.9***

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Group 1: a cohesive subgroup whereby users were tightly connected with each other

Group2: a peripheral group

Next, a regression analysis was conducted to examine how these constructs were associated with news sharing in social media. The results are presented in Table 5.5. The entire model was significant (Adjusted $R^2 = .076$, $F = 380.0$, $p < 0.001$) in predicting users' information sharing in Twitter. Specifically, opinion leader measured by degree centrality ($\beta = .148$, $p < .001$) showed the most impact on users' information sharing behavior. Also, the other two measurements of opinion leadership (closeness and betweenness) were significant. However, tie strength and news liking were not significantly associated with information sharing in Twitter.

Table 5.5 Regression Analysis (N=23193)

<i>Independent Variables</i>	<i>Standardized</i>	<i>t-values</i>
	<i>Beta</i>	
Opinion leader (Degree)	.148	19.198***
Opinion leader (Closeness)	.092	11.000***
Opinion leader (Betweenness)	-.022	-3.069**
Tie strength	.113	14.072
News liking	-.041	-6.423
F(5, 23035)	380.0***	
Adjusted R ²	.076	

Note: a. dependent variable is "number of tweets shared"

b. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The results showed that opinion leadership was the most significant variable that influenced user's information sharing in social media. Indeed, opinion leaders possess more accurate knowledge and tend to be less susceptible to norms and more innovative (van Eck, Jager, & Leeflang, 2011). They would like to share more information to highlight their position among users. In particular, having a more central network position is the key factor driving opinion leaders to share more

information in Twitter. According to our findings, the three different network indexes, i.e., degree centrality, closeness centrality, and betweenness centrality, have different influences in spreading information in the network. It was found that opinion leaders measured by degree centrality and closeness centrality are motivated to share more information and take charge of the information flow in that social network. However, opinion leaders measured by betweenness centrality are less likely to share information in Twitter. One possible explanation is that opinion leaders measured by betweenness centrality are positioned as “bridges” among different subgroups. They may tend to be more cautious and careful when sharing information as what they share is supposed to be acceptable by groups of users having different information interests.

Furthermore, the findings suggested that all three indexes were suitable for measuring opinion leaders in the context of Twitter network. One possible explanation is that in Twitter opinion leaders tend to behave in different ways due to the complexity and diversity of the network structures in Twitter. There are different types of opinion leaders. Some have a large number of followers, some are close to other users in the network, and some act as “bridges” to connect different groups. All of them are supposed to play the role of opinion leaders in Twitter networks.

Interestingly, in terms of homophily at the network level, the present study identified a large group whose members are actively involved in sharing information. Prior research has reported the roles of a small group of users who monitor a variety of sources and disseminate interesting information to the audiences in a network (Lehmann et al., 2013). Surprisingly, this subgroup of users is larger than expected in Twitter, more than three fourths in all. This means most users in Twitter are connected directly or indirectly in one big network and are actively sharing information with others, creating a public sphere highlighted by the dynamics of publication and distribution of information. In other words, homophily in the network level was found to promote information sharing in Twitter.

However, tie strength and news liking showed no significant relations with information sharing behavior. In terms of tie strength, one explanation is that in Twitter most social ties are weak ties as most social ties in Twitter are one way direction rather than reciprocal ties. For instance, celebrities have millions of followers but hundreds of friends. Such context has no advantage in terms of information sharing on the behalf of each other. Previous studies identified that people are more

likely to share information in strong tie networks (e.g., family members, friends) (Steffes & Burgee, 2009). In the case of Twitter where a large portion of social ties consist of weak ties, tie strength has little influence on information sharing behavior. Regarding news liking, the problem may be that the content of Twitter is too diverse and noisy. Therefore the present study cannot identify users' news liking tendency and further reveal the relationship between news liking and information sharing behavior. This highlights the importance to examine a social media platform with mostly news related content.

To sum up, the Twitter analysis found that users were connected in one huge network to share information and opinion leaders was found to be an important factor influencing information sharing in social media. The findings from Twitter show that opinion leaders in Twitter can be measured in three different ways. In addition, homophily was found to promote information sharing in Twitter. However, due to the nature of content in Twitter which also includes non news items, the network characteristics and news attributes were not able to be examined. Hence, a social news website will be valuable to shed light on the sharing patterns as well as network structures. Digg was selected as the social news platform to study news sharing in social media.

Study on News Sharing in Digg

Digg

Digg (<http://digg.com>) is a social media website designed for sharing news. Digg is widely used by previous studies as source of secondary data to investigate news sharing. Users can conduct a variety of actions to news stories: (1) "digg" or share news stories which are submitted by other users; (2) submit news stories from external websites such as mainstream news providers, blogs and amateur content; (3) comment news stories in the manner of thread discussions.

In each user's profile, information concerning users' activities was presented in different action category, such as "digg", "submission" and "comment". All these three actions will result in the sharing of news with a user's connections. Thus, in the present context, news sharing means to submit, share, or comment a news story in social media. In addition, Digg also allows users to form social network by connecting with other users and further track their connections' activities. The lists of followers

(users who are subscribing to the subject) and following (users to whom the subject is subscribing) are also presented in users' profiles. As the user data and news information is well structured and recorded in Digg, these features make it an ideal platform for our study to collect network data and news sharing activities. In addition, as the sharing content of Digg is news, it is possible to compare news sharing in Digg with information sharing in Twitter. It should be noted that the Digg has some major transformations in 2013 after the data collection. For instance, the news items were submitted by the website rather than users themselves. However, this should not affect the present study as all the analyses were done before the changes.

Methodology

In this section, the data collection procedure is introduced, followed by the methods utilized to analyze the data, and measurements of the conceptual constructs used.

Data Collection

A program based on the Digg API was developed to automatically crawl the network data. The present study applied the snowball sampling technique to collect the sample (Biernacki & Waldorf, 1981). The sampling procedure is similar to Twitter analysis. Firstly, one user as seed node was randomly selected and the profile information of the users directly connected to the seed user were crawled, including user name, number of news submitted and shared, number of comments, following and follower lists, news items presented in the profile, news types, and news source. This consisted of the first layer of the sampling. Next, the profile information of the second layer was crawled by visiting users directly connected to users on the first layer. This process continued until the numbers of uses reached the limit. Regarding the sample size, we followed the criteria used in the Twitter analysis. As the Twitter analysis had a sample of 20,000 users and the total number of users in Digg is less than that in Twitter, the present research finally targeted at a sample of 10,000 users in Digg.

Furthermore, as the present study investigated online news sharing, it is necessary to identify users who were active. Here, the present study defined an active user as one who had submitted, shared or commented at least one news story on Digg in the last 30 days before we started to collect the data. We used the same criteria for the data collection from Twitter. Meanwhile, inactive users were defined as lurkers

who connected with active users but did not have any online activities recently (i.e., 30 days). The rest were regarded as leavers who neither conducted any online activities nor connected with active users for news processing. While users who had already left the online community were not within the scope of our current study, the inactive users who connected with active users were still important in a sense that they acted as the audience in the news sharing procedure. As such, the present study filtered out leavers in our sample and kept the active and inactive users who were both involved in the procedure of news sharing as broadcasters and receivers. As a result, the present study had a sample of 5430 users, including 713 active users and 4717 inactive users (see Table 5.6).

With the same program the present study also downloaded the news stories archived in each user’s profile which were shared, submitted or commented. It was noted that not all the news stories shared or submitted were available for downloading because the Digg API only provided information about the latest 20-25 news stories in each action category of every user. As a result, our sample included 70292 news stories. We collected the relevant information of each news item, including the title, descriptions, news type, source, and online duration.

Table 5.6 Sample Demographics (N=5430)

Category	N	No. of followers		No. of followings	
		Mean	Std.	Mean	Std.
Active users	713	3035	7464	407	439
Inactive users	4717	848	4423	582	1176
Entire sample	5430	1135	4985	559	1110

Analysis Methods

The present study applied a hybrid approach combining social network analysis with statistical tests including t-test and multiple regressions. By using social network analysis, the present study aimed to get the metrics to measure the characteristics of social network, including opinion leadership, tie strength, and homophily. Specifically, the present study used Pajek to analyze the network data as in the Twitter analysis. The core-periphery pattern of subgroups was also identified by

the component function of Pajek. We further applied t-tests to investigate whether there existed significant differences between different subgroups in terms of their news sharing activities (e.g., submitting news, spreading and commenting). Lastly, we applied multiple regression to test what factors proposed by the present study had significant associations with users' news sharing behavior in social media.

Operational Measurements

In this section, the present study explains how to measure the variables in the sample data introduced in the literature review. Specifically, these include measurements of predictors (including opinion leadership, homophily, tie strength, and news liking) and users' news sharing.

- Opinion leadership

The present study used the same operationalization as in the Twitter analysis. The opinion leadership is measured by three indexes, including degree centrality, closeness centrality, and betweenness centrality. This makes the results comparable.

- Homophily

Homophily assumes that social interactions are more likely to take place among individuals who share similar characteristics, as hypothesized in H4a. In the present study, we aim to test such an assumption by determining whether the degree of similarity between connected users would influence their news sharing behavior. Specifically, the present study captures the similarity between users by detecting how many common news stories they shared. In other words, the present study measures users' similarity in terms of news interest. As such, Jaccard's index was applied to measure the similarity (Hamers et al., 1989), as shown in the following:

$$Jac(i,j) = \frac{coc(i,j)}{cit(i) + cit(j) - coc(i,j)}$$

Jac (i,j) = the degree of similarity between subject i and j

coc (i,j) = total number of items present in both subjects

cit (i) = the number of items present in subject i

cit (j) = the number of items present in subject j

A Jaccard's Index of one indicates that all the items are shared by the two users. If the Jaccard's Index is near 0, this means there are few if any common items that are shared. In the present study, by calculating the Jaccard's Index for each pair of a user's connections and taking the average, the result is used as a measurement of how similar the user was compared to his/her connections in terms of news interests.

- Tie strength

The same operationalization was applied as in the data collection of Twitter. Reciprocal ties were used as indicator of strong ties in the network. Furthermore, the proportion of reciprocal ties a user has was used as the measurement of how strongly the user is embedded in his/her network.

- News Liking

In the present study, news liking was measured by checking whether a user had more clear preferences to certain types of news. This is different from the measurement used in Twitter analysis as the news category is much clearer in Digg. For each user, the news stories that were shared, submitted or commented were collected. Originally, each news story was labelled by one of the ten news categories in Digg (i.e., business, politics, science, technology and international news, entertainment, gaming, lifestyle, sports, and offbeat). Based on previous categories of news stories (Thelwall, Byrne, & Goody, 2007), the news stories were further classified into two groupings, i.e., hard news and soft news. Specifically, the category of hard news included business, politics, science, technology and international news, while soft news referred to entertainment, gaming, lifestyle, sports, and offbeat. The following equation was used to transform the data into an index which could indicate the news liking of users.

$$NL_{(i)} = \ln \frac{x}{1 - x}$$

NL (i) = the news liking of user i

x = the percentage of hard news stories user i shared

If a user shared the same number of hard and soft news, the value will be 0. This indicates that the user is neutral and has no specific preference about news types.

If a user shares more hard news than soft news, the value will be positive. The more hard news the user shares, the higher the value is. On the contrary, if more soft news is shared, the value will be negative.

- News sharing

Unlike Study 1 that used primary data, secondary data from Digg was used in Study 2. As such, data on actual news sharing activity can be collected. Specifically, the user profiles in Digg included his or her actions. There are three types of actions a user could conduct on a news story, including sharing, submitting, and commenting. All these three actions could result in the spread of news stories within the online network. Therefore, all the three actions were taken into consideration as the measurement of news sharing.

After identifying the independent and dependent variables involved in the present study, the correlations among them were examined for multicollinearity (refer to Table 5.7). The results showed there were no high correlations among the independent variables. Thus, multicollinearity will not be an issue.

Table 5.7 Correlations among Independent Variables (Pearson)

	Opinion leader (Degree)	Opinion leader (Closeness)	Opinion leader (Betweenness)	Homophily	Tie strength	News liking
Opinion leader (Degree)	1					
Opinion leader (Closeness)	0.651**	1				
Opinion leader (Betweenness)	0.329**	0.327**	1			
Homophily	0.538**	0.407**	0.155**	1		
Tie strength	0.789**	0.439**	0.427**	0.434**	1	
News liking	-0.028*	-0.014	-0.002	-0.049**	-0.029*	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Results

Descriptive Statistics

The description of the sample network is shown in Table 5.8. For the entire network, there were 5430 users in total, connected by 117254 social ties. The density of the whole network is 0.004, which indicated that the network is very loosely connected. Each user had 43 neighbours on average. For the active network whereby active users consist of, there were 713 users connected by 52659 ties. It was found that the active users were more densely connected with each other compared to the whole network, which is indicated by the metrics of density and average degree.

Table 5.8 Network Metrics

Category	Description	Active network	Whole network
Active users	the number of total users in the network	713	5430
Inactive users	the number of directed lines in the network	52659	117254
	the number of lines in the network, expressed as a proportion of the maximum possible number of lines	0.104	0.004
Entire sample	the degree of a node is the number of lines incident with it	147.7	43.2

Regarding news types, technology news was shared the most when compared to the other news topics, followed by entertainment and offbeat news. In terms of news sources, YouTube was the favourite news source for Digg users, followed by Imgur, a photo-sharing website, and Reddit, another social news website like Digg. There were also some main stream news websites, such as Daily Mail, Telegraph, BBC, New York Times, and so on.

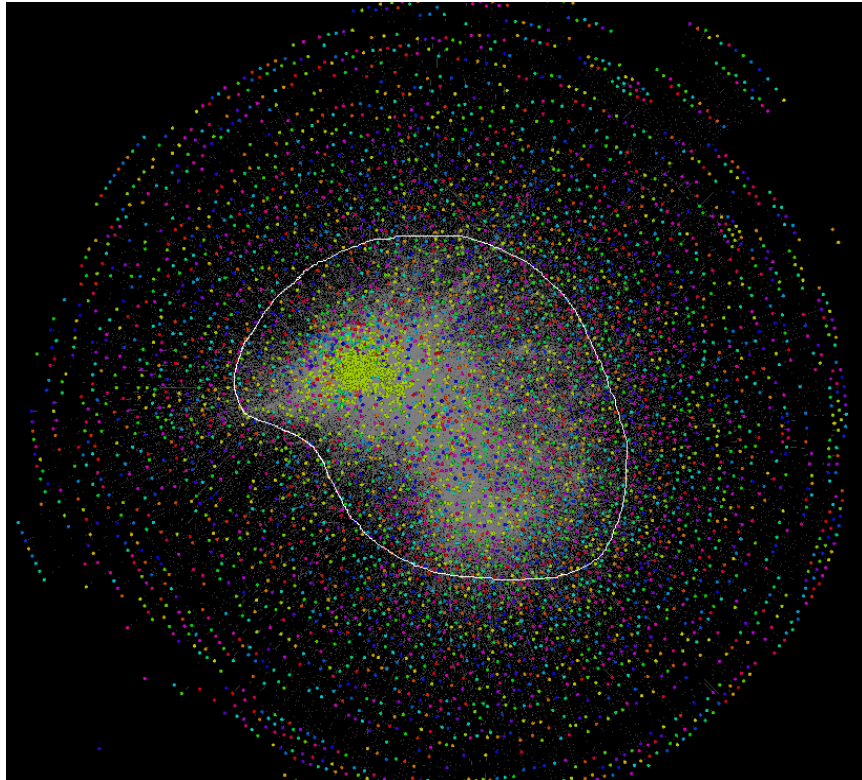
By applying the component function in Pajek, it was identified that there existed a subgroup in which users were more densely connected with each other (shown in Figure 5.3). Figure 5.3a presents the whole network of our sample, in the

middle of which is a “core” (highlighted part in the centre) representing the subgroup. It was found that a small group of users were tightly connected with each other while others were isolated from this group. Figure 5.3b further visualizes the network structures of the “core” subgroup.

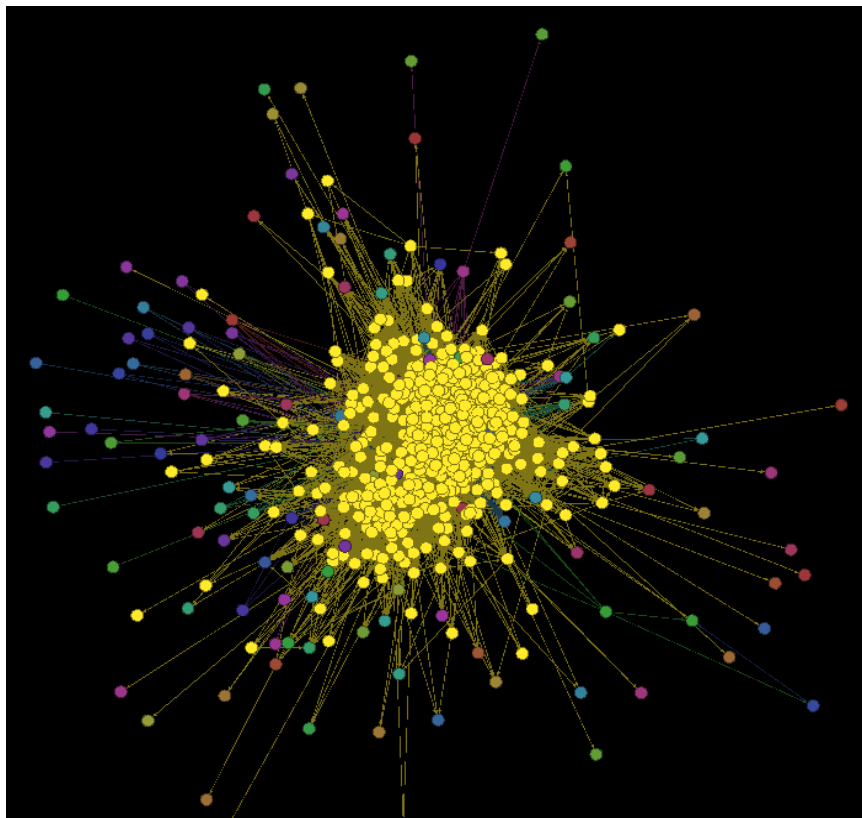
Furthermore, it was tested whether people involved in the subgroup had more interactions in terms of news sharing, submitting, and commenting. Here, the t-test was applied to compare users within the subgroup and users outside the subgroup. It was found that there were significant differences between the two groups in their news activities (shown in Table 5.9). Users involved in the subgroup were more likely to share and interact with each other. In particular, it was also found that users in the subgroup shared more soft news than hard news while users outside the subgroup did not show any specific preference on news types.

Table 5.9 Comparison of News Actions Between Groups

Category	Users within the subgroup	Users outside the subgroup	T-test
N	586	4844	--
Activity	585	128	--
Mean of Diggs	29531	5364	861.6***
Mean of Submissions	752	196	272.6***
Mean of Comments	940	308	121.1***
News Liking	-0.321	-0.065	8.255**



a. the whole network with a “core” subgroup



b. the structure of the subgroup

Figure 5.3 Visualization of the Sample Network

Regression Results

The results of the regression analysis are presented in Table 5.10. The entire model was significant (Adjusted R2= .515, F=963.3, p<0.001) in predicting users' news sharing in social media. Specifically, degree centrality ($\beta = .703$, $p < .001$) showed the most impact on users' news sharing behavior. In other words, opinion leadership is regarded as the strongest factor that motivates users to share news in social media. So H3a was supported. However, the other two measurements of opinion leadership were not significant. The second strongest factor, news liking ($\beta = .040$, $p < .001$) was also found to be positively associated with news sharing behavior. In particular, the coefficient is positive. This indicates that users who prefer hard news are more likely to share in social media. Thus H2b was supported. In addition, tie strength ($\beta = .037$, $p < .05$) was significantly associated with news sharing behavior. This indicates that when users are involved in strong tie networks, they are more likely to share news with each other. So H4b was supported. Lastly, homophily ($\beta = -.032$, $p < .01$) showed a significant relationship with news sharing behavior. However, contrary to expectations, the relationship was negative, which indicates that connecting with similar others would decrease news sharing behavior. Hence, H4a was not supported.

Table 5.10 Regression Analysis (N=5430)

Independent Variables	Standardized Beta	t-values
Opinion leader (Degree)	.703	36.523***
Opinion leader (Closeness)	-.005	-.363
Opinion leader (Betweenness)	.016	1.481
Homophily	-.032	-2.879**
Strong Tie	.037	2.269*
News Liking	.040	4.249***
F(6, 5423)	963.3***	
Adjusted R2	.515	

Based on the diffusion of innovations theory, this study aimed to examine the factors influence users' news sharing in social media. Utilizing network data from

Digg, a social media platform specifying on news sharing, it was identified that opinion leadership, tie strength, and news liking were influential factors driving users to share news.

Discussion

Opinion Leadership

According to our findings, opinion leadership was the strongest variable predicting users' news sharing. Essentially, opinion leaders are inclined to seek for the state of "public individualization" in their social networks (Tsang & Zhou, 2005). In the offline context, in order to achieve such a goal, they are highly involved in digesting new information into their own opinion frameworks and further giving suggestions to others (Feick & Price, 1987). In particular, with the facilitation of the Internet, opinion forwarding/passing has become an important dimension of opinion leadership (Sun et al., 2006). Opinion leaders share raw information directly to satisfy others' opinion-seeking needs while keeping themselves as main sources of information in their online networks. News sharing is such a typical opinion forwarding/passing procedure whereby individuals may strive to share news in order to establish their influential positions as opinion leaders in terms of information sources for massive users in social media.

It should be noted that only opinion leader measured by degree centrality significantly influenced news sharing. The other two indexes, closeness centrality and betweenness centrality, were found not to be significantly associated with news sharing in social media. By having more followers, users are motivated to share news and highlight their status as opinion leaders in their networks. However, closeness and betweenness centrality may not be able to capture the meaning of opinion leader in the Digg context.

Due to the nature of the Internet and in particular social media, the flow of information among many individuals is greatly facilitated (Maignan & Lukas, 1997). While social media helps opinion leaders to spread information to a larger number of people, it seems to lower the "threshold" for individuals to establish their influence online as opinion leaders. That is, individuals who usually play the role of opinion seeking in the offline context may also become influential by simply sharing information online, which further blurs the line between opinion leaders and opinion

seekers (Chu & Kim, 2011). Opinion seekers may easily become opinion leaders by actively sharing information in the online context. In other words, the threshold of being an opinion leader becomes lower. Meanwhile, the faster flow of information in social media may overload opinion leaders resulting in less time to digest information or to provide their own opinions. In order to keep pace with users' informational needs, they may choose to forward or share news directly with a few clicks of the mouse. Paradoxically, this may undermine the influence of opinion leaders as social network actors to provide opinions.

Homophily

In the present study, the phenomenon of homophily was not supported. The present study found that when a user was embedded in a homophilious local network, he/she was less likely to share news. In other words, users are not motivated to share news when they are connected within a network in which members share similar new interests. One possible explanation is that when users are seeking for information sources, they tend to connect with others who have similar news interests and form a homophilious local network. However, they are not inclined to exert effort as they perceive their effort contributes little to the group performance (Kreijns, Kirschner, & Jochems, 2003). They tend to think others will exert efforts to share rather than themselves. Therefore, they lack the motivation to contribute and mainly rely on news content shared by others.

Tie Strength

Based on the findings, the present study also revealed stronger ties, indicated by reciprocal connections in the network, could significantly motivate users to share news. When sharing content within online networks, people expect their actions to be reciprocated (Rafaeli & Ariel, 2008). When users are connected by reciprocal relationships, they are aware of the actions of each other and are likely to have a better understanding about what can satisfy the information needs of other network users. Further, based on the perspective of social capital which allows a person to draw on resources from other members of the networks to which he or she belongs (Ellison, Steinfield, & Lampe, 2007), news sharing can be regarded as a way for users to accumulate social capital online by exchanging new information.

News Liking

Last but not least, the present study found that news liking was significantly associated with news sharing. Basically, news liking underlies feelings of pleasure toward the content of the news stories (Sundar, 1999). The probability for liked news to be shared and discussed is high since users are more likely to interact with informational content that they like.

Notably, the findings indicated that users who liked hard news were more active in sharing news. This seemed to contradict with the results regarding homophily which showed that users who liked soft news played the role as an “engine” for news flow in the network. Actually, even though the news ecosystem was dominated by soft news fans, most of them were generally reluctant to share news. However, though the hard news fans were peripherally positioned as minority in the network, they were more active in sharing news. In the context of certain social issues, it was revealed that minority tried to use social media network to strengthen their awareness and make their voice sounded (Rankovic, 2011). Therefore, it is possible that hard news fans shared news actively in order to change the dominant atmosphere of soft news and make their preferred hard news popular.

Results from Twitter and Digg

In this section, the results from Twitter and Digg will be summarized and compared. Firstly, in terms of opinion leadership, both platforms showed that opinion leaders were significantly associated with content sharing in social media. However, the results were slightly different. In the context of information sharing in Twitter, opinion leadership can be measured in different ways, including degree centrality, closeness centrality, and betweenness centrality. It means that in Twitter opinion leaders can be situated in different positions and still play significant roles. However, in Digg, only opinion leaders measured by degree centrality showed significant relationship with news sharing. An explanation for such a finding could be due to the diverse types of content (e.g. news, business information, and advertisements) were shared in Twitter while only news-related content was shared in Digg (Sriram et al., 2010). This finding suggests that different types of content may have important implications on the network structures as well as the influence of network positions. Choi and Park (2014) also found that types of content shared in the communities can

impact network structures. In the present research, it was found that for homogeneous news content networks in social media, the actor with the most number of connections (as measured by degree centrality) is the most influential. However, for networks with more diverse types of content such as Twitter, the concept of opinion leader is more complex. Here, the finding from the current study suggests that opinion leader can be an actor in the network who has the most number of connections, who has the shortest path to everyone else in the network or who is acting as a bridge connecting sub-networks.

In terms of tie strength, the results were also different. In Twitter, tie strength showed no significant influence, whereas in Digg tie strength was found to be positively associated with news sharing. This may be attributed to the different characteristics of networks in the two platforms. It was found that Digg's social network was denser and more interconnected than Twitter's (Lerman & Ghosh, 2010). That is, in Digg users are more involved in the local network. When they share a news item, their networks are more stable to react. This means that the connections created are more lasting and tend to be strengthened by sharing and interacting. The stronger the social ties are, the more they are likely to share. However, as there are more users in the Twitter network, it is more challenging to develop strong connections with other users in the network. It was found that in Twitter, communities devoted to sharing information tend to be lack of tight social norms, and reciprocal relationships were not common in the networks (Choi & Park, 2014). As strong tie relationships are formed partly on the basis of reciprocal services, the context in Twitter may not be suitable for maintaining and developing strong-tie relationships. Thus, the strength of ties cannot exert influence on information sharing in Twitter.

Thirdly, in terms of homophily, a core-periphery pattern in the network level was found in both platforms. That is, there existed a subgroup in which users were more densely connected with each other and users involved in the subgroup had more interactions in terms of sharing. The present study further tested homophily in the individual level in Digg. However, it turned out that when users were connected with similar others in terms of news interests, they were reluctant to share news but rely on others to share. This explains why in social media the users who actively share are always minority and the most become free-riders in the networks (Kreijns, Kirschner, & Jochems, 2003).

Lastly, in Digg news liking was found to be significantly associated with news sharing. However, in Twitter it was not significant. One possible explanation is that in Twitter the shared content is more diverse. Specifically, content in Twitter include news and other non-news related content. On the contrary, in Digg users focus on news sharing only and the feeling towards the news play an important role when they tend to share. In other words, it is easier to determine preferences and liking compared to the more heterogeneous content in Twitter.

Results from Study 1 and Study 2

In this section, the results from Study 1 and Study 2 will be summarized. From the perspective of the uses and gratifications theory, Study 1 identified that socializing was the most significant variable associated with users' news sharing in social media, followed by information learning and status seeking. Firstly, users socialize with others in social media by sharing news. Through a variety of activities such as commenting, voting and tagging, users can interact with each other and further initiate social contacts with them. News sharing becomes a means to satisfy users' need to develop and maintain social relationships in social media. Secondly, users' news sharing in social media is motivated by the information learning gratification. Indeed, social media can help users to effectively access relevant news information, because they are usually connected with others who have similar news interests. Through collaborative filtering, users can easily find what they prefer to read and share. Lastly, the perceived gratification of status seeking is also identified as a significant factor motivating users to share news in social media. This means that users attempt to establish status by sharing news in the online communities. In social media, by sharing news content, users can gain attention from peers in the networks. If what they share turn out to be reliable and valuable, they may become information sources for others to follow in the networks and gain status as opinion leaders.

On the basis of the diffusion of innovations theory, both Study 1 and Study 2 found that opinion leadership, tie strength and news liking were key factors underlying users' news sharing in social media. The difference is that Study 1 applied primary data while Study 2 used secondary data. While it is appropriate to use subjective data to measure motivational factors from the uses and gratifications perspective, there are concerns that the subjective data may not accurately capture the network

environmental factors derived from diffusion of innovations theory. Thus, in Study 2 the present research applied secondary data harvested from social media platforms to complement the weakness of Study 1.

Specifically, opinion leadership was found to be the most significant variable impacting users' news sharing through the lens of diffusion of innovations theory. The concept of opinion leadership originates from the two-step flow theory which argues that the influence of mass media first reaches opinion leaders who then pass on to others what they read and hear about (Rogers, 2003). In the offline context, opinion leaders tend to have high social status in terms of social, cultural, demographic characteristics which drive their influence (Xu et al., 2014). However, in the online context, as individuals' identity and social cues are limited, the basis of influence of opinion leaders seems to be changed. Online opinion leadership lies in the ability to influence the information flow (Xu et al., 2014). This is further confirmed by the analysis of secondary data measuring opinion leadership in social media platforms. Rather than social or demographic characteristics, the present research identified that individuals' network structural position would significantly impact one's sharing behavior and further influence the information flow (i.e., news content). Specifically, the users who have high degree centrality, or have a large number of followers, are more likely to share news in their networks. As users are connected within the online networks, what they share will be informed to each other. Having a large number of followers guarantees what they share can be exposed to a great deal of audiences. This drives users who are positioned as opinion leaders to share more than non leaders. From the individual psychological perspective, the tendency of becoming opinion leaders motivates users to share news in social media. By sharing news, users can provide others with up-to-date information and further express their own opinions. This will help to gain attention from others and make them to follow, which in turn increases the number of their followers and enhance their central position as opinion leaders.

In terms of tie strength, both studies found that strong ties have significant influence on users' news sharing in social media. Based on self-perceptions of users, Study 1 found that users are more likely to share news in the strong tie networks. Individuals in strong tie relationships are found to be more helpful and accessible, provide more assistance and support to one another, and exhibit higher levels of trust

(McFadyen, Semadeni, & Cannella, 2009). In addition, the sharing actions tend to be reciprocated in strong tie networks than weak ties, motivating users to share news for each other. Whereas weak ties may be crucial in explaining information flow across groups (Brown & Reingen, 1987), the present research affirms that strong ties play a more significant role in users' news sharing procedure. However, users' self perceptions may not accurately reflect the strength of ties in their networks. Thus, Study 2 applied secondary data to further test the effects of strong tie networks on users' news sharing in social media. Specifically, the present research used reciprocal connections to measure the strength of ties among users. It was found that the more reciprocal ties users have in their networks, the more news they would like to share with their connections. By connecting through reciprocal ties, the news sharing behavior is expected to be reciprocated. As a result, they are more likely to spend time and efforts on behalf of each other.

With regard to news attributes, both studies identified that news liking was significant associated with users' news sharing in social media. Users who share liked news stories may expect what they share will also be liked by their neighbours. This would repay users with the positive feeling of helping others (Cho, Chen, & Chung, 2010). Furthermore, through the secondary data harvested from social media, it was revealed that users who like hard news are more likely to share news with their network neighbours. It is possible that hard news users are more likely to express their opinions and debate with each other through sharing hard news. It should be noted that in Study 1 it was found that news quality and credibility cannot exert significant influence on users' news sharing. Thus, social media users really have to be careful when they read and share news in social media. Unlike other social media platforms such as Wikipedia, the concept of collaborative knowledge building, whereby users participated in the knowledge contribution process as well as the process errors correction over a period of time (Cho, Chen, & Chung, 2010), may not apply for news related content due to the time sensitive nature of the news. Further, sometimes some news content may spread like wild fires due to the social environmental factors. Thus, news consumers and news sharers in social media have to be careful and be able to filter the information when accessing news online.

In sum, drawing from the uses and gratification theory and diffusion of innovations theory, the proposed framework on news sharing in social media shed

light on the influential gratification factors and the network environmental factors. e. Specifically, the gratification factors that were found to exert significant influence on users' news sharing in social media were socializing, status seeking, and information learning. In terms of diffusion of innovations theory, news liking, opinion leadership, and tie strength can impact users' news sharing in social media. However, news credibility and quality, as well as homophily, were found to have little impact on users' news sharing in social media.

CHAPTER SIX CONCLUSION

This chapter summarizes the accomplishments of the present research. The implications and limitations of the present research are detailed.

Summary of Accomplishments

News delivered by a variety of media channels can impact our daily life and the framing of reality (McCombs & Reynolds, 2009; Rubin & Step, 2000). Given the significant influence of social media on daily news flow, the goal of the entire research is to investigate what factors may exert influence on people's news sharing in social media. Specifically, the two research objectives of the research are as follows: 1) to identify the motivational factors that drive users to share news in social media; 2) to investigate how news attributes, opinion leadership, and diffusion networks impact news sharing in social media. To achieve the research objectives, a conceptual model is proposed on the basis of the uses and gratifications theory and diffusion of innovations theory. The model lays the foundation for the present research to identify what factors, in the aspects of perceive gratifications, news attributes, opinion leadership, and diffusion networks, can influence news sharing in social media.

The first research objective was achieved by applying the uses and gratifications theory to explore users' motivations underlying news sharing in social media. Study 1 found that the perceived gratifications of socializing, status seeking, and information learning are significantly associated news sharing. Specifically, results suggest that socializing is the most salient motivation in terms of perceived gratifications, followed by information learning and status seeking. This indicates that through sharing news, people expect not only to learn new information but also to participate in social interactions and attain reputation in online communities. In this sense, social media has transformed news sharing into a social activity, which is attributed to social media's capability of connecting users and facilitating a variety of activities, such as discussing, tagging, and rating. Through the revealing of motivations underlying users' news sharing, the present research illustrates that people have come to emphasize much more on the social aspects of media use. However, the uses and gratifications theory investigates individual motivations from an internal-psychological perspective (Katz, Gurevitch, & Haas, 1973; Rubin, 2009). As news sharing is influenced by people's social gratifications, influential factors stemming

from the external-social environment may exert a significant influence as well, which is the orientation of the second research objective.

To achieve the second objective, potential influential determinants to news sharing are drawn from the diffusion of innovations theory. Specifically, opinion leader perception through the lens of opinion leadership, tie strength a characteristic of diffusion networks, and news liking/relevance in terms of news attributes, have been identified as significant factors that impact users' news sharing in social media. Indeed, this is one of the first studies which apply the diffusion of innovations theory to examine the news sharing process. By incorporating this perspective, the present study extended beyond the explanations provided by the uses and gratifications framework, which ultimately improved the explanatory power of the research model. From the perspective of diffusion of innovations theory, opinion leadership is the most salient variable impacting news sharing, followed by tie strength and news liking.

Taken together, Study 1 identified that opinion leadership is the most significant variable that impacts users' news sharing, followed by news liking and socializing. Users who tend to be opinion leaders regard sharing news as an effective way to establish their position and reputation among peers, which may also be inferred from the significance of the status seeking gratification identified in the present study. Further, news liking/relevance, as one of news attributes, can significantly influence users' news sharing. That is, compared to other criteria such as credibility and quality, users are concerned more about whether the news stories are interesting and relevant to the information needs of oneself and/or the community. Thus, it may be concluded that through sharing interesting and relevant news stories in social media, users anticipate to socialize with each other and further achieve leadership among peers.

It is noted that Study 1 is based on the analysis of self-report data. Self-report data may not accurately reflect users' actual sharing behavior. For example, the measurement of opinion leadership in Study1 is based on users' self-perceptions but whether they are viewed as opinion leaders on social media platforms is not validated. Put differently, Study 1 focused on identifying the influence of factors on the basis of users' subjective perceptions. While the use of subjective data to measure motivations from the uses and gratifications perspectives is appropriate, there are concerns that the subjective data may not capture the network environmental factors accurately. Specifically, according to the diffusion of innovation theoretical perspective, network

environment factors such as opinion leadership, tie strength and homophily are important and will be difficult to be perceived accurately by individuals. Hence, to complement the subjective data in Study 1, secondary data was harvested from social media platforms which facilitated news sharing to further examine the influential factors derived from the network environment (i.e., opinion leadership, tie strength, homophily, and news liking).

In Study 2, the effects of the diffusion of innovation perspective were further examined using data harvested from social media platforms. First, Twitter was chosen as a benchmarking platform because the informational content spread in Twitter is time sensitive and shares common attributes with news. However, the limitation of Twitter as a study on news sharing platform has to be acknowledged. Specifically, content in Twitter also include non news-related items. Nevertheless, the study on Twitter shed insights of the influence of network positions and as well as the roles (opinion leaders or followers) played by the network users who are in such strategic positions. Social network analysis method was applied on the Twitter dataset. The results showed that opinion leadership was the most significant variable impacting information sharing in Twitter. Users who are positioned as opinion leaders in the network structures are more likely to share news or other information than users who are not playing the role of an opinion leader.

Next, a social news website, Digg, was chosen to further examine the influence of the factors from the diffusion of innovations perspective. As a social news website, the content on Digg is all news related, making it a very appropriate platform for the current research study. The network structures of Digg users were harvested, along with user information and news information. Through social network analysis, the present research found that opinion leadership, news liking and tie strength were all significant factors underlying users' news sharing in social media. Notably, while the phenomenon of homophily exists in the macro level of the network, such similarity among users actually hampered news sharing in users' local networks. Unlike the results from Twitter which focused on more general information sharing, the results from Digg show that news liking and tie strength are also significant variables besides opinion leadership. A plausible explanation for the differences in findings is the news related content in Digg. Compared to general information sharing, news is more likely to arouse one's interests and emotion which ultimately strengthen the relationship

among users. Further, the content in Digg is homogeneously news-related and as such it is easier to determine preferences and liking compared to the more heterogeneous contents in Twitter.

Taken all together, through two independent studies the present research identifies several influential factors underlying users' news sharing in social media. In terms of psychological factors, the present research finds that socializing, information learning and status seeking are significantly associated with users' news sharing online. With regard to environmental factors, it is identified that opinion leadership, news liking and tie strength can significantly impact users' news sharing in social media.

Based on the outcomes of the present research, the following articles have been published:

Journal papers:

Ma, L., Lee, C.S., and Goh, D.H. (2014). Understanding News Sharing in Social Media: An Explanation from the Diffusion of Innovations Theory. *Online Information Review*, 38(5), 598-615..

Lee, C.S. and Ma, L. (2012). News Sharing in Social Media: The Effect of Gratifications and Prior Experience. *Computers in Human Behavior*, 28(2), 331-339.

Conference papers:

Ma, L., Lee, C.S., and Goh, D.H. (2013). Understanding news sharing in social media from the diffusion of innovations perspective. In *Proceedings of the 2013 IEEE International Conference on Cyber, Physical and Social Computing*, August 20-23, Beijing, China, 1013-1020.

Ma, L., Lee, C.S., and Goh, D.H. (2013). Investigating influential factors influencing users to share news in social media: A diffusion of innovations perspective, In *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries, JCDL 2013*, July 22-26 2013, Indianapolis, Indiana, USA, 403-404.

Ma, L., Lee, C.S., and Goh, D.H. (2012). Sharing in social news Websites: Examining the influence of news attributes and news sharers. Paper accepted to the 9th *International Conference on Information Technology: New Generations ITNG 2012*, April 16-18, Las Vegas, Nevada, USA.

- Ma, L., Lee, C. S., Goh, D.H. (2012) Understanding News Sharing in Social Media: An Explanation from the Diffusion of Innovations Theory. Paper accepted for presentation at the 62nd International Communication Association Annual Conference, Phoenix, Arizona May 24-28, 2012
- Lee, C.S. Ma, L. and Goh, D. H. (2011). Why Do People Share News in Social Media. In Proceedings of the 2011 International Conference on Active Media Technology, Lecture Notes in Computer Science, pp.129-140, Lanzhou, China, September 7-9 2011.
- Ma, L., Lee, C. S. and Goh, D. H. (2011). That's News to Me: The Influence of Perceived Gratifications and Personal Experience on News Sharing in Social Media. In Proceedings of the ACM/IEEE Joint Conference on Digital Libraries, JCDL 2011, pp. 141-144, Ottawa, Canada, 13-17 June 2011.

Implications

The present research contributes to the literature in several aspects. Firstly, this is one of the first studies that investigate antecedents of users' news sharing in social media. Especially, information learning, socializing, status seeking, opinion leadership, tie strength and news liking were found to be significantly associated with users' news sharing. Secondly, the present research affirms that the uses and gratifications theory is theoretically valid in explaining users' motivations for news sharing in social media context. Thirdly, the present study demonstrates that the diffusion of innovations theory, as a complementary approach to the uses and gratifications framework, can significantly improve the explanatory ability of the conceptual model examining users' news sharing in social media. In addition, this is one of the first few studies applying social network analysis to study users' online news sharing behavior. The hybrid approach combining social network analysis with statistical tests in our research provides an innovative way to investigate the influence of social network in the process of news sharing in social media. Another contribution the present research made is to compare the content sharing in different platforms (Twitter vs. Digg), which shed light on how the influential factors are changed when it comes to general information sharing and news sharing in social media. Last but not the least, the present research used both primary and secondary data to complement the shortcomings of each other, which makes the findings more reliable.

For practitioners, the influential factors revealed by the present study may help to stimulate users' active participation in social media and improve business performance. Social media are only as good as the content their users share (Burke, Marlow, & Lento, 2009). Thus, designers of social media platforms should improve the user experience to encourage the sharing of content. Here, implications for the design of social media platforms for news sharing can be drawn from the findings.

- First, social news platforms should provide facilities for users to interact with each other through news sharing. According to the findings, socializing and status seeking are the top motivations for sharing news. Thus, designers should consider how various features could be provided to support these motivations. For instance, when the news shared by individuals receives comments and responses, an alert (e.g., via email) can be sent to users to encourage further debates and idea exchanges. As users intend to gain reputation and establish status through news sharing, social media platforms should prominently feature users who share the most number of news in a time period (e.g. one day, one week), or whose shared news receive the highest ratings. Further, users can acquire titles by their usage levels (e.g., junior contributor, senior contributor) based on the amount of news they share and the ratings of their shared content.
- Second, given the influence of opinion leadership, social media platforms should identify the roles that individuals play and provide corresponding strategies to increase their satisfaction. As opinion leaders value status and reputation, social media may highlight such people prominently as influential users. Further, since opinion followers are willing to receive information from opinion leaders, news stories shared by opinion leaders may be highlighted for followers to process. In addition, social media platforms should try to identify users who are acting as accelerators of news flow in online social networks and attempt to win these users' approval to spread news information in various situations, such as product/service promotion, and crisis response. For marketers, identifying opinion leaders can help in the delivery and promotion of product information because opinion leaders are more interconnected and are advantageous for spreading content.
- Lastly, in order to increase users' news sharing, social media platforms should help users to develop strong tie relationships among users. To initiate such

social connections, platforms could support the identification of individuals with similar news interests. For example, based on the news content shared by individuals, a social media platform may recommend a user to connect with those who have shared or read similar news topics. Also, social media may incentivize users to provide more personal information in their online profiles, similar to social networking services. This may increase interaction frequency among users and help to develop strong tie relationships, which in turn enhance users' news sharing in their online social networks.

For users of social media, the present research highlighted that news shared in social media are driven by psychological and environmental factors. However, the credibility and quality of news is seldom considered when users share news. This highlights that news consumers on these platforms have to be more careful when accessing news. In other words, social media users consuming online news in social media platforms need to filter the credible news from rumors and misinformation. As news may affect how individuals view reality, social media platforms should also help users to verify the credibility of news and encourage users to share news in good quality.

Limitations

There are some limitations in the present research that warrants caution in interpreting the results. Firstly, the findings may partially be shaped by the unique setting of this research. As the present research specifically focused on news, the results may not be applicable to explain the sharing of other types of informational content in social media. Secondly, the present research did not consider the influence of different types of social media platforms on users' news sharing. Some platforms are characterized by the presence of users' real identities (e.g., Facebook) while others are mostly anonymous (e.g., YouTube). The characteristics of the resulting diffusion networks (e.g., homophily, tie strength) may thus be different, which may exert influence on users' sharing. Another limitation is that sampling technique used in the survey has its weaknesses. The ideal way to recruit respondents is to randomly select students on the basis of the whole population at the local university. However, on the basis of the availability and willingness, the present study applied convenience sampling by approaching the course instructors and inviting students taking the courses to participate in this research. However, despite these weaknesses, the students

in these classes are generally representative. In addition, convenience sampling is still an effective strategy to recruit respondents and has been widely adopted in past research (e.g., Johnson & Kaye, 2004). Further, this study did not differentiate the impact of different types of news. Individual users may have different preferences for news types (e.g., hard news like politics and science, soft news like entertainment and sports) (Lehman-Wilzig & Seletzky, 2010). As perceived liking of news stories has been found to influence users' news sharing, news types may thus also influence such behavior. In addition, the different informational content was not differentiated in Twitter. The ideal situation is to identify news items among a variety of informational content and study news sharing in a more general context. In the Digg study, because of the restriction of Digg API, only the latest 20-25 news stories of every user were available to download. As homophily was measured based on the news items (i.e., Jaccard index), this may affect the measurement of the homophily variable. Lastly, the operationalizations of homophily and tie strength have some problem. The conceptual definitions of these variables are broader and more multi-faceted than the operationalization used. Nevertheless, the measurements are still valid according to the validity test. To sum up, despite these limitations, the conclusions remain important as the results contribute to the knowledge of how social and psychological factors influenced users' sharing in social media.

Future Work

The present research also proposes some directions for scholars to study in the further works.

Firstly, it is important to automatically identify the informational content shared in social media. Indeed, a variety of information is shared in social media, including private information, news, advertisement, events and so on. The influential factors underlying the sharing of different informational content are supposed to be different. Thus, it is necessary to identify what information is being shared. In order to study news sharing, the present research has to specifically find a social news website. The ideal situation is to directly identify news items from kinds of informational content shared in social media. This makes the comparison of the sharing of different informational content easier and more reasonable. Although some scholars have made some contributions to the classification of information in social media like tweets in

Twitter (e.g., Sriram et al., 2010), the complicate computing process still makes the application problematic.

Secondly, previous research has identified a S-shaped diffusion curve concerning the process of innovation diffusion. This is, after about 10-25% of users in a social system adopt an innovation as earlier adopters, a large number of users will follow with a relatively rapid rate of adoption, and then a period in which the remaining users finally adopt. In particular, the diffusion rate takes off quickly in a certain period whereby opinion leaders are involved into the diffusion process (Rogers, 2003). However, this phenomenon was mostly identified in the offline context. Whether this is applicable to characterize the news diffusion process online has yet to be verified. Unlike the diffusion process of technological innovations that consists of several stages such as persuasion and implementation, news diffusion only requires the awareness-knowledge of the news events among people (Rogers, 2003). News events spread much more rapidly than technological innovations, which require just a few hours instead of months and years (Idid, 1994). In other words, with the prevalence of social media, the diffusion process is significantly accelerated. Thus whether the process of news diffusion in social media follows the S-shaped curve, and what role opinion leaders play during this process should be revisited.

Lastly, it will be interesting to study the relationships between the shared content and the characteristics of network structures. As identified in the present research, the network structures of opinion leaders tend to be different due to the different types of content shared in the networks. In other words, opinion leaders may behave differently according to the context of shared content. It is possible that network structures of opinion leaders in the context of political information sharing are different from those in advertisement spreading. Furthermore, it is still not clear whether this conclusion can be extended to other characteristics of network structures like homophily and tie strength. Thus, it is valuable to examine how the shared content may exert influence on the network structures whereby users are interacting with each other.

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APPENDIX

A. Questionnaire

Social Media Usage and News Accessing Project

Section A

Firstly, please tell us some information about yourself. All data will be kept **STRICTLY CONFIDENTIAL**.

A1. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female
A2. Age: _____
A3. What is the highest level of education you have completed? <input type="checkbox"/> Elementary/High school <input type="checkbox"/> Junior College/Polytechnic <input type="checkbox"/> Bachelor Degree <input type="checkbox"/> Master Degree <input type="checkbox"/> Doctorate Degree
A4. What is your educational background? <input type="checkbox"/> Computer science/IT <input type="checkbox"/> Engineering <input type="checkbox"/> Arts, humanities, social sciences <input type="checkbox"/> Business <input type="checkbox"/> Hospitality/tourism <input type="checkbox"/> Medicine <input type="checkbox"/> Architecture, environment <input type="checkbox"/> Education <input type="checkbox"/> Advertising, design and media <input type="checkbox"/> Life/health sciences <input type="checkbox"/> Sports and leisure <input type="checkbox"/> Others (Please specify) _____
A5. In your daily life, you can access the Internet at: (You may select more than one choice) <input type="checkbox"/> Home <input type="checkbox"/> Workplace <input type="checkbox"/> School <input type="checkbox"/> Transportation <input type="checkbox"/> Café <input type="checkbox"/> Others _____

Section B: Social Media Usage

B1. What kind of social media account do you have? (You may select more than one choice) <input type="checkbox"/> Social Networking (Facebook, Myspace) <input type="checkbox"/> Microblogging (Twitter, Pownce) <input type="checkbox"/> Wiki (Wikispace) <input type="checkbox"/> Blog (Blogger, Wordpress) <input type="checkbox"/> Photo,Video Sharing (Podcast, Flickr, Youtube) <input type="checkbox"/> Social Bookmarking (Digg, Del.iciou.us) <input type="checkbox"/> Others (please specify): _____
--

Please indicate your social media usage **habits**.

1 – very infrequent (once a week or less/never)

2 – infrequent (a few times a week)

3 – frequent (around once a day)

4 – quite frequent (2-5 times a day)

5 – very frequent (more than 5 times a day)

B2. In general, how often do you use social media?	1	2	3	4	5
B3. How often do you use social media to write blogs?	1	2	3	4	5

B4. How often do you use social media for micro-blogging?	1	2	3	4	5
B5. How often do you use social media for social networking?	1	2	3	4	5
B6. How often do you use social media to share pictures and videos?	1	2	3	4	5
B7. How often do you use social media to read news stories?	1	2	3	4	5
B8. How often do you use social media to share news?	1	2	3	4	5
B9. You engaged in news reading in social media with the following frequency:	1	2	3	4	5
B10. You engaged in news sharing in social media with the following frequency	1	2	3	4	5
B11. What topics of news stories would you like to <u>read</u> in social media? (may select more than one)					
<input type="checkbox"/> Politics <input type="checkbox"/> Entertainment(not sports) <input type="checkbox"/> Economy/Business <input type="checkbox"/> Crime/Victims <input type="checkbox"/> Sports <input type="checkbox"/> Science/Technology <input type="checkbox"/> Natural disasters <input type="checkbox"/> Human Rights <input type="checkbox"/> Tourism <input type="checkbox"/> Environment <input type="checkbox"/> Law <input type="checkbox"/> Health/Medicine <input type="checkbox"/> International Aid <input type="checkbox"/> Religion <input type="checkbox"/> Military <input type="checkbox"/> Culture <input type="checkbox"/> Agriculture <input type="checkbox"/> Education <input type="checkbox"/> Social Services <input type="checkbox"/> Others (please specify): _____					
B12. What topics of news stories would you like to <u>share</u> in social media? (may select more than one)					
<input type="checkbox"/> Politics <input type="checkbox"/> Entertainment(not sports) <input type="checkbox"/> Economy/Business <input type="checkbox"/> Crime/Victims <input type="checkbox"/> Sports <input type="checkbox"/> Science/Technology <input type="checkbox"/> Natural disasters <input type="checkbox"/> Human Rights <input type="checkbox"/> Tourism <input type="checkbox"/> Environment <input type="checkbox"/> Law <input type="checkbox"/> Health/Medicine <input type="checkbox"/> International Aid <input type="checkbox"/> Religion <input type="checkbox"/> Military <input type="checkbox"/> Culture <input type="checkbox"/> Agriculture <input type="checkbox"/> Education <input type="checkbox"/> Social Services <input type="checkbox"/> Others (please specify): _____					
B13. Please indicate <u>one</u> social media platform that you like most to access news stories.					
<input type="checkbox"/> _____					
B14. How many connections/friends do you have in this social media account?					
<input type="checkbox"/> around _____					
ATTENTION: Please answer all the following questions based on THIS selected social media platform.					

Section C: Online Social Networking

How do you **interact** with other people you connect with **on the selected social media platform**?

1 – strongly disagree 2 – disagree 3 – neutral 4 – agree 5 – strongly agree

	Strongly Disagree			Strongly Agree	
C1. Other people would like to visit my profile to access news stories.	1	2	3	4	5
C2. The news stories I share on this platform seem to be influential to other people.	1	2	3	4	5
C3. People with whom I connect on this social media platform share news based on what I have contributed and shared.	1	2	3	4	5
C4. Some users in this social media platform are influential, acting as opinion leaders.	1	2	3	4	5
C5. These opinion leaders are reliable and trustworthy.	1	2	3	4	5
C6. News stories shared by opinion leaders are attractive.	1	2	3	4	5
C7. When I want to read news, I'd like to access what influential people have contributed and shared.	1	2	3	4	5
C8. When I want to share news, I tend to access what influential people have contributed and shared.	1	2	3	4	5

Please indicate the degree of **similarity of the users on the selected social media platform.**

	Strongly Disagree			Strongly agree	
C9. Most of people I connect with on this platform have a lot in common with me.	1	2	3	4	5
C10. Their backgrounds are similar to mine.	1	2	3	4	5
C11. Their thoughts and interests are similar to mine.	1	2	3	4	5
C12. They express attitudes similar to mine	1	2	3	4	5

How do you find the **relationships** between you and other people you connect with **on the selected social media platform?**

	Strongly Disagree			Strongly agree	
C13. I am in close contact with the people who are in my online social network.	1	2	3	4	5
C14. I have good relationships with people who are in my online social network.	1	2	3	4	5
C15. I enjoy reading news stories shared by the people who are in my online social network.	1	2	3	4	5

C16. I enjoy sharing news stories with the people who are in my online social network.	1	2	3	4	5
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Section D: Online News Evaluation

How do you feel the degree of **credibility** of news stories on the selected social media platform?

	Strongly Disagree			Strongly Agree	
D1. On this social media platform, news stories generated by users are objective.	1	2	3	4	5
D2. These news stories are unbiased.	1	2	3	4	5
D3. I think news stories provided by social media are trustworthy.	1	2	3	4	5
D4. Comments left by other users can justify the objectivity of news.	1	2	3	4	5

How do you **like** the news stories in on the selected social media platform?

	Strongly Disagree			Strongly Agree	
D5. I enjoy reading news stories generated by users on this platform.	1	2	3	4	5
D6. I find these news stories interesting.	1	2	3	4	5
D7. I like to rate and contribute to the comments after news stories.	1	2	3	4	5
D8. The news stories are always conveyed in a lively way.	1	2	3	4	5

How do you find the **quality** of news stories on the selected social media platform?

	Strongly Disagree			Strongly Agree	
D9. On this social media platform, news stories contributed by users are concise.	1	2	3	4	5
D10. Comments make the news stories clear enough.	1	2	3	4	5
D11. Good news stories are always highly rated by peers.	1	2	3	4	5
D12. News stories are comprehensive on this social media platform.	1	2	3	4	5
D13. News stories are always well-written on this platform.	1	2	3	4	5

Generally, how do you find news stories on the selected social media platform?

	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
D14. News stories on this platform are reported in a timely manner.	1	2	3	4	5
D15. Comments left by users make news stories more informative.	1	2	3	4	5
D16. News stories contributed by users are relevant to our daily life.	1	2	3	4	5
D17. Generally, I think news stories on this platform are important.	1	2	3	4	5

Section E: Motivations to Share News

Please indicate the motivations to participate in news sharing on the selected social media platform.

I intend to share news stories in social media	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
E1. Because it helps me to store useful information.	1	2	3	4	5
E2. Because it is easy to retrieve information when I need.	1	2	3	4	5
E3. To keep up to date on the latest news and events.	1	2	3	4	5
E4. To get information about something.	1	2	3	4	5
E5. Because I can interact with people when sharing news.	1	2	3	4	5
E6. To keep in touch with people.	1	2	3	4	5
E7. Because it is effective to exchange ideas with other people.	1	2	3	4	5
E8. To help others to access useful information.	1	2	3	4	5
E9. Because it is entertaining	1	2	3	4	5
E10. Because it helps me pass time.	1	2	3	4	5
E11. To combat boredom.	1	2	3	4	5
E12. Because it helps to relax.	1	2	3	4	5
E13. To get away from pressures.	1	2	3	4	5
E14. To role play or experiment with my identity	1	2	3	4	5
E15. Because it is a pleasant break from my routine	1	2	3	4	5

E16. Because it helps me feel important when sharing news.	1	2	3	4	5
E17. Because it helps me to gain status when sharing news stories.	1	2	3	4	5
E18. Because it helps to look good when sharing news stories.	1	2	3	4	5

Section F: Intentions

Please indicate your intentions to read or share news on the selected social media platform in the future.

	Strongly Disagree		Strongly Agree		
	1	2	3	4	5
F1. I intend to <u>read</u> news stories on this social media platform in the future.	1	2	3	4	5
F2. I expect to <u>read</u> news stories contributed by other users.	1	2	3	4	5
F3. I plan to <u>read</u> news stories on this platform regularly.	1	2	3	4	5
F4. I intend to <u>share</u> news stories in social media in the future.	1	2	3	4	5
F5. I expect to <u>share</u> news stories contributed by other users.	1	2	3	4	5
F6. I plan to <u>share</u> news stories in social media regularly.	1	2	3	4	5

You have reached the end of the survey.

Thank you very much for your time and participation!

B. Factor Analysis

Factor Analysis for Independent Variables in the Model

N=310	Factors											
<i>I intend to share news in social media ...</i>	1	2	3	4	5	6	7	8	9	10	11	α
1. Enjoyment												.90
To combat boredom.	.842	.125	.006	.024	.159	.083	.082	-.004	.059	-.085	.035	
Because it helps to relax.	.828	.024	-.026	.173	.066	.152	.095	.089	.137	.012	.067	
To get away from pressures.	.821	-.020	.037	.106	.056	.056	.153	.118	.182	-.016	.059	
Because it helps me pass time.	.796	.101	.012	.017	.091	.187	.104	.051	.057	.043	.049	
Because it is a pleasant break from my routine	.726	.074	.072	.118	.040	.024	.062	.086	.269	-.008	.037	
Because it is entertaining	.549	.219	.094	.148	.029	.404	.068	.066	.008	.033	.067	
To role play or experiment with my identity	.529	.040	.101	.036	.088	.015	.174	.163	.482	.070	.137	
2. News liking/relevance												.85
I find these news stories interesting.	.181	.750	.228	.023	.044	.239	.090	.070	-.001	.133	.082	
I enjoy reading news stories generated by users on this platform.	.084	.743	.223	.066	.054	.147	.096	.088	.073	.228	.073	
Generally, I think news stories on this platform are important.	-.012	.587	.080	.143	.131	.020	.306	.259	.237	.092	-.055	
News stories on this platform are reported in a timely manner.	-.017	.586	.146	-.139	.115	.013	.063	.191	.081	-.026	.127	
News stories contributed by users are relevant to our daily life.	.086	.563	.035	.204	.116	.050	.291	.242	.116	.021	-.118	
Comments left by users make news stories more informative.	.135	.556	-.043	.088	.086	.117	.070	.475	.160	-.108	.098	
The news stories are always conveyed in a lively way.	.194	.504	.173	.246	.053	.128	-.009	.210	.078	.293	-.135	
3. Opinion Follower												.80
When I want to read news, I'd like to access what influential people have contributed and shared.	-.029	.128	.757	-.025	.078	.060	.155	.116	.027	.069	.003	
News stories shared by opinion leaders are attractive.	.075	.257	.685	.197	.016	.094	.075	.208	.110	-.043	.041	
When I want to share news, I tend to access	.024	.093	.661	.135	.181	.156	.214	.036	.074	.119	.084	

what influential people have contributed and shared.												
These opinion leaders are reliable and trustworthy.	.060	.128	.581	.266	.225	.110	.120	.069	.182	.173	.103	
When I want to read news, I'd like to access what influential people have contributed and shared.	.079	.234	.488	.327	.002	.087	.122	.136	.212	-.200	-.034	Dropped
4. Opinion Leader												.81
The news stories I share on this platform seem to be influential to other people.	.116	.054	.169	.776	.098	.053	.211	.118	.099	.033	.138	
Other people would like to visit my profile to access news stories.	.141	.009	.097	.748	.072	.125	.167	.038	.079	.107	.136	
People with whom I connect on this social media platform share news based on what I have contributed and shared.	.106	.028	.336	.647	.129	.185	.190	.074	-.030	.112	.114	
I like to rate and contribute to the comments after news stories.	.240	.346	.027	.536	.063	.275	-.079	.112	.196	.080	.125	
5. Homophily												.85
Their thoughts and interests are similar to mine.	.101	.055	.146	-.089	.857	.080	.043	.003	.037	.120	.118	
They express attitudes similar to mine	.095	.039	.187	1.719 E-5	.808	.084	.008	.040	.099	.176	.034	
Most of people I connect with on this platform have a lot in common with me.	.079	.189	.080	.175	.724	.116	.060	.099	.010	.101	.180	
Their backgrounds are similar to mine.	.150	.120	-.014	.277	.704	-.035	.122	.047	-.047	.028	.170	
6. Socializing												.86
Because it is effective to exchange ideas with other people.	.082	.126	.174	.078	.092	.759	.227	.143	.146	-.002	.075	
To keep in touch with people.	.356	.135	.073	.124	.051	.747	.150	.127	.059	.058	.073	
Because I can interact with people when sharing news.	.272	.124	.127	.203	.124	.738	.150	.187	.119	.020	.105	
To help others to access useful information.	.055	.230	.108	.181	.066	.541	.302	.085	.351	.000	.015	
7. Information Learning												.89
Because it is easy to retrieve information when	.199	.136	.148	.162	.085	.099	.795	.039	.140	.154	.006	

I need.												
Because it helps me to store useful information.	.168	.153	.196	.159	.118	.129	.769	.067	.152	.142	.044	
To keep up to date on the latest news and events.	.173	.223	.186	.166	.011	.314	.676	.140	.084	.043	.122	
To get information about something.	.200	.114	.221	.124	.026	.350	.622	.143	.106	-.011	.067	
8. New Quality												.79
Comments make the news stories clear enough.	.143	.186	.129	.134	.017	.109	.092	.747	.100	.141	.043	
Good news stories are always highly rated by peers.	.165	.257	.180	-.046	-.012	.062	.218	.657	.031	-.021	.090	
Comments left by other users can justify the objectivity of news.	-.032	.062	.119	-.040	.017	.190	.020	.556	.038	.351	.187	
News stories are comprehensive on this social media platform.	.064	.305	.063	.263	.053	.196	-.032	.545	.188	.125	.068	
News stories are always well-written on this platform.	.118	.161	.132	.094	.221	.074	.066	.524	.219	.340	.066	
On this social media platform, news stories contributed by users are concise.	.180	.287	.333	.111	.233	.017	.025	.344	.097	.176	-.154	Dropped
9. Status Seeking												.92
Because it helps me to gain status when sharing news stories.	.254	.155	.100	.063	.005	.157	.161	.100	.813	.127	.037	
Because it helps to look good when sharing news stories.	.259	.155	.159	.092	.023	.143	.040	.119	.803	.128	.097	
Because it helps me feel important when sharing news.	.281	.126	.135	.126	.065	.140	.194	.169	.759	.111	.038	
10. News Credibility												.75
These news stories are unbiased.	-.015	.000	.041	.113	.245	.022	.119	.085	.063	.776	.015	
I think news stories provided by social media are trustworthy.	-.079	.218	.256	.065	.080	.087	.064	.135	.148	.712	.099	
On this social media platform, news stories generated by users are objective.	.022	.150	-.083	.055	.083	-.064	.075	.171	.086	.682	.116	
11. Tie Strength												.75
I have good relationships with people who are in my online social network.	.172	.037	.010	.189	.252	.106	.058	.240	.056	.065	.735	
I am in close contact with	.087	-.033	.006	.210	.311	.040	.009	.145	.100	.108	.725	

the people who are in my online social network.												
I enjoy reading news stories shared by the people who are in my online social network.	.089	.507	.223	.078	.052	.179	.112	-.047	.036	.195	.548	
I enjoy sharing news stories with the people who are in my online social network.	.195	.269	.245	.398	.059	.206	.215	-.073	.175	.136	.444	Dro- pped
Variance Explained	9.47%	8.01%	6.08%	5.98%	5.97%	5.95%	5.89%	5.77%	5.74%	4.74%	3.91%	
Eigenvalue	4.83	4.08	3.10	3.05	3.05	3.04	3.00	2.94	2.93	2.42	1.99	

Note: Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 8 iterations.

C. Regression Models

Model 1 (N=310)

Independent Variables	Standardized Beta	t-values
First block		
Information learning	.249	4.427***
Enjoyment	.084	1.530
Socializing	.290	4.977***
Status seeking	.186	3.414**
Multiple R	.654***	
Adjusted R ²	.420***	

Note: a. dependent variable is "users' news sharing".

b. *p < .05, **p < .01, *** p < .001

Model 2 (N=310)

Independent Variables	Standardized Beta	t-values
First block		
Information learning	.192	3.386**
Enjoyment	.083	1.534
Socializing	.234	3.974***
Status seeking	.129	2.321*
Liking/ Relevance	.179	3.051**
Quality	.070	1.177
Credibility	-.002	-.039
Multiple R	.678***	
Adjusted R ²	.448***	

Note: a. dependent variable is "users' news sharing".

b. *p < .05, **p < .01, *** p < .001

Model 3 (N=310)

Independent Variables	Standardized Beta	t-values
First block		
Information learning	.087	1.634
Enjoyment	.032	2.861**
Socializing	.153	4.977***
Status seeking	.127	2.535*
Liking/ Relevance	.170	3.166**
Quality	.015	.276
Credibility	-.065	-1.439
Opinion leader	.337	7.044***
Opinion follower	.006	.129
Homophily	.014	.317
Tie strength	.148	3.107**
Multiple R		.759***
Adjusted R ²		.560***

Note: a. dependent variable is "users' news sharing".

b. *p < .05, **p < .01, *** p < .001