



A review of social networking service (SNS) research in communication journals from 2006 to 2011

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Abstract

This article presents a review of the scholarship on social networking services (SNS) in the period from 2006 to 2011. Through a full scan of the academic output published in six high-ranking communication journals listed in the Social Science Citation Index (SSCI) within the six-year period, 84 directly relevant articles were identified. The study summarizes the objects of study, methodological preferences, and thematic patterns of recent SNS research. Challenges to the field and several reflections are addressed. The findings provide not only an overview of current ongoing research trends but also insights for future studies.

Keywords

Literature review, methodological preference, objects of study, social networking services, thematic pattern

Introduction

Social networking services (SNS) have become central, virtually unavoidable media for social interaction in recent years and the phenomenon has attracted considerable attention in the field of communication. Scholars show great interest in the impact of SNS on the ways in which relationships and networks are established, mediated, and maintained, and consequently the change they bring to our society. After a half-decade of development,

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despite a few recent bibliographic analyses in other fields of social science—mostly by scholars in psychology (e.g. Piotrowski, 2012; Wilson et al., 2012)—there is as yet little research conducted on the broader scope of SNS in the rapidly emerging literature. Thus, this paper tries to focus on the ongoing scholarly work in the field of communication and reports the findings of an extensive review of the published SNS studies in six referred journals over the period from 2006 to 2011. The aim of the study is to provide an overview of the current developmental status of SNS research in the field. It is hoped that the examination of research patterns and trends will serve as a useful and informative exercise in addressing the popularity or shifts in attention. In the end, we expect that this study will provide insights for future research in the domain of SNS.

Defining SNS: From website-based to integrative service

In the current literature, the acronym “SNS” is frequently used, but sometimes it is unclear what exactly this refers to. In 2007, boyd and Ellison described the features of SNS and briefly summarized the development of scholarship in previous SNS literature; they proposed a definition for this form of social media, which has been widely adopted by later research. SNS was first defined as “social network site,” referring to a “web-based service that allow[s] users to 1) construct a public or semipublic profile within a bounded system, 2) articulate a list of other users with whom they share a connection, and 3) view and traverse their list of connections and those made by others within the system” (p. 211). This widely adopted definition emphasizes a distinguishing characteristic of SNSs from previous forms of social media—“the public display of connections.” Indeed, such a “crucial component of SNSs” (p. 213) is a kind of visualization of the network. Before the launch of SNS, one could not directly access network information (e.g. number of friends, mutual friends, joined groups, etc.) about others with whom one is communicating, most of which was usually intangible in previous methods of interpersonal interaction. With the help of SNS, information provided by the creators (users) and their inter-correlating connections became visible because of the computational programs embedded in the systems (Lampe et al., 2006; Tong et al., 2008). Through these self-generated and system-generated information systems, users can now easily traverse the network by clicking through one another’s friend lists on the SNS profiles. Researchers are able to generate information for analysis of the interconnectivity and structural patterns of the networks. As indicated, such functions make SNS novel, in comparison to face-to-face (FtF) interaction and previous computer-mediated communication (CMC). The communication within/among different social groups or networks has been enhanced because people can actively seek out or pull in information about others with whom they have connected on the virtual platform (Ellison et al., 2007), which allows a larger amount of social information access. Moreover, the uniqueness and integration of personal information on the profiles of SNS users (e.g. name, photo, affiliation, relationship status) decreases the uncertainty of anonymity found in some modes of CMC and provides a more consistent and transparent social interaction process across on- and offline settings. The existing literature has widely discussed the above functional innovations which confirms the validity and applicability of the definition.

In a broader sense, “SNS” can be defined as “social networking service.” This encompasses the underlying structure of the term, covering more technological features and purposes of use in daily life, reflecting the mobile, collective, and dynamic practice of social interaction, because SNS is not simply a static object but a fast-changing phenomenon, both in terms of technological features and usage patterns. It is notable that functional features have been continuously invented all through these years; for example, the evolution from Facebook’s *wall* to *timeline*. Hence, it is necessary to catch up with current developments, to link them to what we have done so far and to improve our epistemological approach in future SNS research. Future developments in both the theoretical concept and applied models are suggested to take the new changes into account via investigation. Perusal of the literature revealed various names for “SNS”; some argue that the term should be regarded as a “service” rather than a “site,” two terms that are frequently used interchangeably. The conceptualization by boyd and Ellison (2007) mainly focused on the characteristics of website-based use of SNS, for example logging into Facebook, MySpace, or LinkedIn with a browser on a personal computer (PC). Such qualifications stem from the years when SNS supported only limited mobile interactions and launched single (or few) language interfaces. Today, with the rapid development of smartphones and high-speed data transmission technologies, major SNS services are all mobile device-capable and provide multi-language interface settings.

Additionally, because of integration with positioning technology (i.e. GPS), a user can easily present his or her social activities to others in other parts of the globe. Today, most SNS, especially those with large numbers of subscribers, have become ubiquitously accessible, with fewer temporal, locational, and cultural (linguistic) constraints. The communicative activities on SNS are more synchronous with and parallel to real social life due to instant updates, other-generated information, and location specifications. This will lead to some interesting implications for future research – for instance, a life history-recording feature (both for users who are alive and those who have passed away).

Literature search and procedures

The present study conducted a full screening of six major venues for communication publication. From the top 10 communication journals ranked by five-year (2006 to 2011) impact factor in the Social Science Citation Index (SSCI), three types of journals were selected: first, general journals that cover the whole field of communication (i.e. *Journal of Communication*, *Communication Research*); second, journals focusing on new media technologies, CMC or, in particular, the social and psychological impacts of online social networks (i.e. *Journal of Computer-Mediated Communication* and *Cyberpsychology, Behavior & Social Networking*); third, journals focusing on individual/interpersonal communication (i.e. *Human Communication Research*). To make the review as complete as possible, the selection criteria also considered relevancy and established trends in new media research (So, 2010; Tomasello et al., 2010). Therefore another SSCI journal, *new media & society* – which is a common outlet for Internet research – was also included. The reason SSCI was used for journal selection criteria is that SSCI journals are generally considered and commonly recognized as having higher research quality, longer histories, and easier accessibility in academia.

Table 1. Number of SNS studies published in selected journals from 2006 to 2011.

Source	5-year impact factor	No. of articles						Total	%
		2006	2007	2008	2009	2010	2011		
1. <i>Journal of Computer-Mediated Communication</i>	4.568	–	8	4	8	1	5	26	31.0
2. <i>Journal of Communication</i>	3.841	–	–	–	–	–	1	1	1.2
3. <i>Cyberpsychology, Behavior & Social Networking</i> ¹	2.732	1	0	6	10	3	23	43	51.2
4. <i>Human Communication Research</i>	2.667	–	–	1	–	–	–	1	1.2
5. <i>Communication Research</i>	2.350	–	–	–	1	–	2	3	3.6
6. <i>new media & society</i>	1.782	–	–	1	1	6	2	10	11.9
Total		1	8	12	20	10	33	84	100.0

Note. 1. Originally *Cyberpsychology & Behavior*; name changed in 2010.

All issues of the six journals published from 2006 to 2011 were fully screened. Due to the frequent but loose use of the term “SNS,” articles with any of the following keywords, either in the titles or abstracts, were all shortlisted: “social network (or networking) site (or service),” “SNS,” “online (social) network,” or the name of any specific SNS platform (e.g. “Facebook,” “MySpace,” and so forth.). A total of 84 articles on the shortlist were found to be directly relevant. Some shortlisted articles were excluded because their investigating objects were either the Internet in general or other CMC tools. We found that *Cyberpsychology, Behavior and Social Networking*, *Journal of Computer-Mediated Communication*, and *new media & society* were the major venues for SNS publications in the past few years. Table 1 summarizes the distributions of found articles in according journals.

Research patterns found

As indicated in a previous review study of Facebook research (Wilson et al., 2012), the perspectives, research questions, and methods are so diverse and fragmented in current SNS literature that it becomes quite difficult to produce a neat and coherent summary of all findings, even just for the studies with empirical data. Despite such difficulties, the present study attempts to outline the patterns in SNS research for further discussion. We provide descriptive analyses for the manifest content, such as objects of study and methodological preferences; for the latent content, such as thematic patterns and related findings of the identified studies, a qualitative summary was conducted. Table 2 summarizes the descriptive analyses of study objects and methodological preferences.

Table 2. Summary of research objects and methodological preferences.

Items	Frequency (Percentage)
Specific SNS examined	Facebook – 37 (44.3%); MySpace – 11 (13.1%); Others – 8 (9.6%); Multiple platforms – 10 (11.9%); Did not indicate – 18 (21.4%).
User population investigated	University student – 46 (54.8%); General SNS/Internet user – 13 (15.5%); High school student or adolescent – 7 (8.4%); Specific group – 6 (7.1%); Young adult (age under 30) – 3 (3.6%); General population – 3 (3.6%); Did not indicate – 6 (7.2%).
Region of sample	US – 45 (53.6%); Netherlands – 8 (9.5%); Australia – 5 (6%); Multinational – 4 (4.87%); UK – 3 (3.6%); Canada – 3 (3.6%); South Korea – 3 (3.6%); Taiwan – 2 (2.4%); Hong Kong – 1 (1.2%); Germany – 1 (1.2%); Italy – 1 (1.2%); Spain – 1 (1.2%); Japan – 1 (1.2%); Did not indicate – 6 (7.2%).
Analytic approach	Quantitative – 63 (75.0%); Qualitative – 10 (11.9%); Combine – 6 (7.1%); Critical – 1 (1.2%); Conceptual/Review – 4 (4.8%).
Main method applied	Survey – 46 (54.8%); Experiment – 14 (16.7%); Content analysis – 9 (10.7%); Interview – 4 (4.8%); Ethnography/participation observation – 4 (4.8%); Textual/thematic Analysis – 2 (2.4%); Not applicable cases – 5 (5.9%).
Observation	Cross-sectional – 55 (65.5%); Longitudinal – 6 (7.1%); Not applicable cases – 23 (27.4%, 14 articles were of experimental design, 4 articles applied ethnographic methods, and 5 were conceptual/critical discussion).

Objects of study

When talking about the objects of SNS study, both the specific platforms and their users should be of concern. First, for investigation of the prevalence of SNS, the study found that, given its global popularity and large user population worldwide, Facebook was the platform (some studies call it “domain”) most investigated by scholars (44.3% of the studies). Studies on MySpace (13.1%) followed in second place, and others (e.g. Hyves, Cyworld, and LinkedIn) constituted the remaining 9.6%. A total of 10 (11.9%) studies discussed more than one SNS platform and 18 (21.4%) did not identify the specific platform for investigation, but discussed SNS in a general sense.

University students were the major user population investigated in previous SNS studies. Some studies also focused on the younger population group: middle/high school students, young people under 30, and adolescents aged 10 to 19. A few studies focused on specific SNS users for their own purposes, such as users in specific relationship statuses (Darvell et al., 2011; Young et al., 2009), university alumni (Farrow and Yuan, 2011), black users (Byrne, 2007), and new users/adopters of SNS (Baker and Moore, 2008; Parks, 2011).

As with other areas of research in communication, the United States is the undisputed pioneer of SNS studies (53.6% of the publications with empirical data were based on US samples); the Netherlands and Australia were the other two major countries, with eight articles (9.5%) based on samples from the Netherlands and five studies (6.0%) from

Australia. Another four studies (4.8%) examined multinational data but still focused on western countries. Only seven studies (8.3%) were conducted in Asia (South Korea, Taiwan, Hong Kong, and Japan), which implies that the study of international/intercultural SNS use remains underdeveloped.

Methodological preferences

In addition to four conceptual articles (4.8%) and one limited to critical discussion (1.2%), 79 studies (94.0%) were done with primary data. The quantitative approach was the predominant methodological preference of SNS studies for data collection. A total of 63 (75%) articles used quantitative methods and statistics for data analysis, while 10 studies (11.9%) used pure qualitative approaches and six studies (7.1%) employed both quantitative and qualitative modes for investigation.

The sample size ranged widely from nine to 127,477 (median=236.5), depending on the selected objects (e.g. individual user, SNS profile) and methodological approach (quantitative or qualitative). It should be noted that most of the samples were not collected by the traditional probability sampling method in social science research. One possible reason is the difficulty in defining the boundaries of SNS user populations. Without a clear method of defining “SNS users” online, it was hard to obtain a comprehensive sampling frame to draw a probability sample. Probability sampling usually relies on offline population, such as university students.

In terms of the times of observation, most studies that did not use experimental or ethnographic methods were cross-sectional observations. Only a few were longitudinal, applying the panel observation method.

Survey/questionnaire was the most frequently used method (54.8%), followed by experiment (16.7%), interview (4.8%), content analysis of SNS user profiles (10.7%), ethnography/participant observation (4.8%), and thematic or textual analysis (2.4%). The rest were conceptual or critical pieces (6.0%). This study found that there were certain patterns of methodological preferences in topics. For example, studies focusing on profile maintenance or impressions (perceptions) of popularity and attractiveness primarily used the experimental method.

Thematic patterns

Existing scholarship on SNS covers a wide range of topics. Indeed, based on different research focuses and perspectives, there are many ways of classifying SNS studies. In this study, we used the four broad themes outlined by boyd and Ellison (2007: 219–222) as a reference to investigate how well SNS studies published in the past half-decade fit with such thematic patterns and, more importantly, to examine if an extended scope may have emerged. We adopted boyd and Ellison’s themes because, generally speaking, these are most typical in our database. However, we acknowledge that there are other themes researched by other SNS scholars and we have included them as the “Extended Scope in SNS Research.”

Impression management and friendship performance. First, boyd and Ellison (2007) pointed out that SNS constitute an important context for CMC research on the

processes of impression management, self-presentation, and friendship formation and performance. Within the sample, 21 articles (25.0%) were focusing on impression management and friendship performance issues on SNS. On SNS platforms, individuals are able to construct their preferred online representation of self and usually have more flexible control over personal image (e.g. Davis, 2010; Leung, 2011). This study confirmed the finding that personalities are related to online activities, particularly profile management and self-promotional behavior. Further, considering the features of social information flows on SNS, we also found that some scholars particularly addressed the differences and interactions among self-generated, others-generated, and system-generated information and investigated their implications for impression management and self-identity (e.g. Rosenberg and Egbert, 2011; Tong et al., 2008; Utz, 2010; Walther et al., 2009). Although most scholars posited that SNS play a positive role in self-presentation and impression management, some argued that SNS users are aware that online self-presentations are misleading among both friends and acquaintances (DeAndrea and Walther, 2011).

Network and network structure. Second, SNS provide many possibilities for researchers because they enable researchers to reveal how people manage their social networks in both manner and size. They raise important questions regarding whether and how online communication activities on such virtual network platforms integrate into or even influence larger social structures. Within the article pool in our data, social capital was found to be a popular theoretical framework among SNS researchers (e.g. Ellison et al., 2007, 2011; Valenzuela et al., 2009; Vergeer and Pelzer, 2009). But their operationalization of the construct is mainly attitudinal or perceptual rather than from a network perspective, not to mention the reflection of structural features via empirical analysis. When talking about social capital, there is a long debate in sociology over whether social capital derives from a dense network of strong relationships or from a looser set of weak connections. In this sense, we found very few studies (2.3%) that actually discussed network features, such as the density, diversity, and structural implication of SNS (e.g., Hampton et al., 2011). From our review, it is suggested that the research about network and network structure is still relatively underdeveloped.

Bridging online and offline networks. Of the articles in the sample, 15 (17.9%) were directly related to bridging online and offline networks. The capacity for socialization and networking is a primary reason why people spend a large amount of time on SNS. Certain functional features of SNS enable users to engage in daily social interaction within the SNS context (Park et al., 2009). Yet we cannot simply jump to the interpretation that people duplicate their offline network in the online realm, in terms of communicative manner and quality. Donath (2007) pointed out that SNS provide a new way to organize and navigate an egocentric offline social network. The virtual network of SNS has extended the social reach of individual users, though Donath (2007: 245) states that “(t)he human beings who make up this global network are in some ways unchanged; (t)hey still must eat, find shelter, and acquire information. Yet how they do these things has changed.” As indicated in our article pool, scholars have provided substantial findings suggesting that online and offline social capitals are positively associated (Ellison et al.,

2007, 2011). Facebook use was found to correlate with individuals' civic engagement and political participation (Park et al., 2009; Valenzuela et al., 2009; Vitak et al., 2011) and active participation in Facebook groups positively predicted the strength of network ties along the dimensions of frequency of communication and emotional closeness, which therefore influenced actual behavior via different routes (Farrow and Yuan, 2011). These findings are in line with the finding of boyd and Ellison (2007) that the network benefits mentioned above are strong when online social interactions supplement existing offline relationships (boyd and Ellison, 2007). In addition, Lee (2009) proved that people with strong social relationships are more likely to use more online communication, which supports the "rich get richer" hypothesis (or "Matthew effect") rather than displacement.

Privacy. Our data show that the fourth theme, mainly focusing on individual privacy and information disclosure, also received much attention. A total of 11 articles (13.1%) covered the related topics. SNS satisfy users' informational needs. Users are motivated to post on SNS to share information and be entertained, keep up with trends, and show off (Waters and Ackerman, 2011). From our review, some scholars pointed out that SNS users continually negotiate and manage the tension between expected benefits and perceived risks (Debatin et al., 2009), though the benefits may outweigh most of the potential risks that might threaten SNS users. Among those negative factors, privacy was the most discussed issue. On SNS, users cannot fully control all of the content posted, and they might lose face or even opportunities (e.g. jobs, scholarships) if any inappropriate content is uploaded by them or their "friends" on the virtual network (Bohnert and Ross, 2010). Interpersonal disclosure is no longer completely intimate and private. In fact, the large amount of shared information about personal status and social activities on SNS somehow connives at unwitting or intentional cyber-stalking (Lyndon et al., 2011). It seems plausible that such monitoring behavior is "socially more acceptable because of the public character of SNS" and "is not per se an intentional activity" (Utz and Beukeboom, 2011: 523). Gossip and rumors are very easy to spread on SNS due to the tracking and fast-forwarding character of news-feeding systems. Users claim to understand privacy issues, yet most of them routinely provide different kinds of personal information on profiles, which can be viewed by unknown others and possibly abused in harmful ways (Lewis et al., 2008). Moreover, risks of privacy invasion are ascribed more to others than to the self (Debatin et al., 2009).

Extended scope in SNS research. From the review, we found that the above four categories are not mutually exclusive and exhaustive. The themes and theoretical roots of certain studies may cover more than one area. For example, studies on impression management and self-presentation also discussed information disclosure and privacy (e.g. Ledbetter et al., 2011). On the other hand, research on network stature and SNS bridging online and offline networks are assumed to be theoretically and practically correlated. Going beyond boyd and Ellison, our data also show that some areas of study have been extended to a broader scope: just as the impression management studies were not limited to friendship performance, a number of relational types have been investigated by SNS researchers, such as romantic (e.g. Elphinston and Noller, 2011), intercultural/racial (e.g. Grasmuck

et al., 2009), and even organization–public (e.g. Farrow and Yuan, 2011) relationships. Regarding the relational improvement effect of SNS, those using them for interpersonal contact are more likely to enhance social connections than those who use them for solitary activities. We also identified that trust (Lin and Lu, 2011; Valenzuela et al., 2009; Walther et al., 2008), attraction (Antheunis and Schouten, 2011; Walther et al., 2008), emotional closeness (Farrow and Yuan, 2011), emotional support (Baker and Moore, 2008; Greenhow and Robelia, 2009; Pollet et al., 2011), and perceived social support (Kim and Lee, 2011; Vergeer and Pelzer, 2009) were facilitated by SNS use. These interpersonal variables were usually used as indicators of the quality of relationships, though their subjectivity has been sometimes criticized.

Furthermore, many studies on the themes of impression management, self-disclosure, and relationship performance, or those that examined the characteristics of a typical SNS user and their personal and social needs through SNS use, tended to adopt the psychological approach to media study, which frequently discusses the impact of SNS on the well-being of individuals. The research into personality traits has been successfully extended to examine CMC and online social networking in the existing literature. Scholars showed great interest in the individual personalities and communicative traits of SNS users, as well as their attitudes and motivations for SNS use and the interplay between these antecedent blocks of variables on SNS activity. In general, SNS use is expected to be associated with the well-being of the users. Previous studies have identified several related intrapersonal psychological traits, including self-esteem (Dong et al., 2008; Ellison et al., 2007; Gonzales and Hancock, 2011; Kalpidou et al., 2011; Utz and Beukeboom, 2011; Valkenburg et al., 2006; Zywica and Danowski, 2008), collective self-esteem (Barker, 2009; Zhang et al., 2011), happiness (Kim and Lee, 2011; Utz and Beukeboom, 2011), satisfaction (Ellison et al., 2007; Utz and Beukeboom, 2011; Valenzuela et al., 2009; Valkenburg et al., 2006), emotional openness (Zhang et al., 2011), and extraversion (Antheunis and Schouten, 2011; Utz, 2010).

In general, past research reported that people experience more happiness and excitement via SNS interactions. However, people were found to be sensitive to certain negative cues as well. For example, research in the past six years indicated that personality characteristics negatively affect individuals' offline and online communication, which include loneliness (Kim et al., 2009; Vergeer and Pelzer, 2009), jealousy (Muise et al., 2009; Utz and Beukeboom, 2011), communication apprehension (Zhang et al., 2011), narcissism (Mehdizadeh, 2010), and neuroticism (Rice and Markey, 2009). Some studies suggest a moderating role of psychological traits in the relationship between SNS use and its impacts. For instance, self-esteem, the most commonly discussed trait, was found to be a significant moderator (Utz and Beukeboom, 2011; Zywica and Danowski, 2008).

Despite most SNS studies in our sample focusing on western countries or the white user population, we found seven articles in which the primary data were collected from non-western or non-white communities. Like most SNS studies in the west, they also investigated SNS usage patterns, with particular interest in the impacts of SNS on interpersonal relationships in Hong Kong, Taiwan, and Korea (e.g. Hsu et al., 2011; Lin and Lu, 2011; Shim et al., 2008; Zhang et al., 2011). Some of these studies did not specify cultural characteristics, only addressing the importance of cultural differences in the limitation section (i.e. Kim, 2011), while one study compared the differences between local

and global popular SNS platforms in Japan (i.e. Takahashi, 2010). Moreover, another study specifically researched the role of SNS in black communities (i.e. Byrne, 2007).

With rapid advances in technology and rising popularity among users, different platforms and brands of SNS have become resourceful databases for social scientists. Based on the review of relevant articles, we found distinct weaknesses and shortcomings in SNS research in the past few years, including ambiguous conceptual definitions, a lack of emphasis on the role of networks, biased measure of SNS use, neglect of the nature of relationships in SNS, the adoption process of SNS, and narrow sampling frames. In the following section, we offer critiques and suggestions for how we should move forward in SNS research.

To emphasize the role of networks

As pointed out earlier, visualization of the networks and social relationships is the outstanding capability that has made SNS novel since their birth. This enables the consideration of network structure during the research process. However, given certain theoretical and methodological constraints, we found that the existing SNS research still underappreciated such features and just provided non-network explanations. This may be due to the general individualism bias in the field of communication. Most studies did not collect network information from users. Such data collection treated individuals (the units of analysis) independently and neglected the empirical proof of the influence of network structure. As SNS integrates interpersonal communicative activities and social networks, future research should pay more attention to the roles and impacts of networks. Thus, we suggest that collecting network information during investigation will advance future SNS studies because it reflects how the intercorrelations of SNS users (social actors) can affect the proposed effects of SNSs.

Adoption of the main assumptions of social network analysis (SNA) might extend our view when looking at the SNS phenomenon. First, actors are interdependent units. They interact with each other within a specific network structure rather than in equal distance. Second, relational ties (linkages) between actors are channels for transfer or “flow” of resources (either material or nonmaterial). Third, network models, focusing on individuals, view the network structural environment as providing opportunities for or constraints on individual action. In addition to the “subjective type” and “content of social networks” discussed by many studies, such as trust, feelings, norms, or support—which are generalized results of social embeddedness—future studies are encouraged to look more precisely at the structure of networks and to investigate whether and how changes in network features, such as network extensity (size, range, and density), network composition (homogeneity or heterogeneity, tie-strength), and social structural positions within the network, may moderate the relational effect of SNS. The rise of the SNS provides significant research opportunities and supplies a useful source for data collection in related network research.

To improve measures of SNS use

As media usage is an essential component of communication research, an accurate and reliable measurement of SNS use is important to theory building, operationalization of

research ideas, and analyses of empirical data. From our review, we found that perceived intensity is a commonly used assessment strategy of SNS use in many quantitative studies (e.g., Ellison et al., 2007; Kalpidou et al., 2011; Utz and Beukeboom, 2011). Based on the intensity of general Facebook use, Valenzuela et al. (2009) modified the measure of intensity of Facebook groups. As people nowadays are engaging with the Internet in a more socially interactive manner, SNS use can be conceptualized and operationalized in more detail. Some studies used specific assessments involving other aspects of SNS usage, such as profile maintenance and grooming (Utz and Beukeboom, 2011), active membership in groups (Farrow and Yuan, 2011), and privacy settings (Debatin et al., 2009; Lewis et al., 2008).

The intensity scale developed by Ellison et al. (2007) is undoubtedly reliable and valid to assess a user's perception about daily habitual use of SNS and his or her connectedness to an online community. Nevertheless, it should be noted that the measure is basically a kind of subjective reflection. The measure may lead to a tendency to report the perceived general popularity of SNS while responding to question items, similar to the measure of the third-person effect. More importantly, the measure is not directly comparable across samples and contexts.

Some scholars (Burke et al., 2010) argued that asking for friend count and time on site is sufficient to measure intensity, as attitudinal self-reports do not correlate with plausible engagement metrics and, in prior studies, attitudinal self-report measures have shown problems such as central tendency and acquiescence bias (Krosnick, 1999; Schwarz et al., 1985). It is likely to become a trend in the field to seek for possible server (system-generated) data that correlate more strongly with attitude reports. Of course, server data such as time online in the previous month may not capture a user's full experience of engagement (Burke et al., 2010), and the simple estimation of time does not distinguish between time spent on actual social activities and that spent on solitary activities. Thus, the development of a more accurate measure of SNS use is necessary (Hargittai, 2007). Researchers are encouraged to continuously look for long-term and multidimensional SNS engagement in the next waves of study.

To rethink the nature of relationship and friendship on SNSs

Relational study is one of the main focuses in the existing SNS research. However, the definition of "relationship" in many SNS studies is actually not clear. Some other disciplines (e.g. public relations, organizational studies, international relations) in which relationships also serve as a central concept share these explication problems (Broom et al., 1997). Hence, another reflection from the present review is that SNS researchers need to pay more attention to the nature of relationships or so-called "friendships" during the investigation process.

If the relationship is regarded as relatively static, there are many ways to define or categorize it. Some of these methods of explication are nominal—for example, relative social role (e.g. parent, schoolmate, and colleague) or goal for relationship (e.g. exchange or communal relationship). This way of categorizing will place the role of the relationship as an antecedent in a conceptual model. Because the nominal approach is usually criticized as incomprehensive and incomparable, many researchers practically adopt an "alternative path" to look at relationships as dynamic process by looking at interactions

and the resources (e.g. time and emotion) one commits to a relationship. However, such practice creates another problem in operationalization, particularly in quantitative research design: assessments of relational interaction can be easily mixed up with SNS (media) uses in measures. Moreover, since the self-administrative survey/questionnaire is usually preferred by SNS researchers, in most cross-sectional designs it will lead to certain difficulties in interpretation of data.

For investigation of how SNS are able to enhance or weaken social connectivity, we argue that consideration of the nature of certain relationships should be helpful and necessary. It is noted that previous studies have not paid enough attention to the nature of relationships during investigation. Instead, most generally adopt overall measures, such as overall closeness to “friends,” personal well-being, social support, or even social capital to reflect the abstract terms of online “social relationships.” This method of conceptualization and operationalization leads to uncertainty regarding the basic concept and difficulties in direct comparison of results.

Moreover, the characters of online networks, which are formed by relationships, can be private or public, open or closed, small or large, free or restrictive, commercial or noncommercial, depending on certain circumstances, interests, priorities, geographical location, technological factors, etc. This neglect of the nature of relationships and networks may lead to the dilemma of existing empirical findings showing different and even contradictory judgments or conclusions on the issue, which implies the necessity to re-evaluate the impact brought by SNS. Future research should enhance the measures and indicators of specific relationships when conducting studies on the relational enhancement effect of SNS.

To consider the dynamic adoption process of SNS (longitudinal effect)

The present study raises a call for longitudinal studies in the future to examine the impact of SNS, because consideration of the dynamic adoption process can provide a more comprehensive picture of SNA usage patterns. For example, it is widely argued that frequent communication supported by SNS activities can facilitate the formation of positive attitudes toward a relationship, while the mechanism behind it (how such positive attitudes are established and how long they will last) is usually under-discussed due to methodological limitations. Longitudinal data should be helpful to researchers for interpreting the results of psychological, relational, and social impacts, and they are needed to conclusively establish the temporal order to improve causality inference.

People usually hold the perception that SNS are strong in their abilities both to activate latent ties (e.g. friends who have lost contact for years) and to bridge new social ties (e.g. friends of friends). They believe that such strengths of SNS can compensate for disconnected or less frequently connected relationships as a result of the constraints of time and space, especially the latter. Some studies support the notion that the establishment of new ties and social bridging is a significant motivation or gratification for SNS use. However, some have also suggested that the main purpose of network extension is less important. Boyd and Ellison (2007) argue that “networking” or looking to meet new people is not the primary practice for most SNS users. They believe that the most frequent interactions on Facebook are between people and their inner social circles or those

with existing connections. In other words, compared to network bonding, the significance of the social bridging function is weaker among users in a longitudinal process. This may be partly due to the cross-sectional design. This is one of the discussible issues awaiting further examination via longitudinal study to look into the dynamic process of adoption practices.

Moreover, in contrast to studies in the early developmental stage of SNS research, an increasing amount of research shows less positive results, which challenge the expected effects of SNS. Vergeer and Pelzer (2009: 203) give a possible explanation for this: "(A)fter registering probably out of curiosity and peer pressure, the membership of one or multiple SNSs may just weakly associate with the actual online communication within the online network." People can hardly enclose their entire social network in one single online social network because it is still impossible to connect or transfer several layers of social networks to a single online network. Given the limited time available for socializing, the need to maintain relationships with frequent contact places a limit on the scope of networks that can be maintained at particular levels of emotional intensity. Whether the networks differ in richness of communication cues or in network composition is unclear, but it is possible that the integration of online and offline networks will gradually change along with the adoption of SNS. Hence, rather than applying cross-sectional investigations and seldom distinguishing between the specific adoption stages of respondents, this study encourages the use of the longitudinal method for future study. Researchers can investigate the development of online communities over time and focus on factors that raise and maintain the sustainability of online communities.

To expand to cross-contextual and cross-cultural contexts

Students at both the university and the high school level were the major sampling targets for investigation. Although it is agreed that "[university] students are often forerunners in the adoption of new communication technologies and their communication networks tend to be dense and multilayered" (Lewis et al., 2008), the exclusive use of this target sample still leaves questions about the applicability of results from campus to other contexts, such as users in working environments and the elderly population. One explanation for the emphasis on student samples may be operational convenience, especially for surveys. Factors such as time available to spend on social interaction, priority placed on socializing, emotional maturity, ICT abilities, and so forth can differ from context to context. Different sample-selection criteria across studies may bring varying conclusions regarding the impacts of SNS. Thus, as mostly recommended by other fields in social science, future research should recognize the value and importance of cross-contextual and cross-cultural sampling methods.

Current research on SNS has primarily been developed in North American or European cultural contexts, and this might be problematic in that it inadequately explains the communication behavior of non-western populations. To date, little research published in the major communication journals has yet touched on the mechanism of SNS use within non-western contexts and its cultural implications for relationships and networks. Among the sampled articles, only a few pieces of work collected samples from non-western countries or discussed SNS usage among the non-white population. Future research is

needed into wider cultural backgrounds, such as the Asian culture, which is deeply rooted in Confucianism, emphasizing long-term relationships, the personal influence model, humanism, face, loyalty, order, and harmony. It is likely that the usage patterns and implications of SNS in this context would be different from existing findings. Thus, future research with sound and more diverse sampling techniques will enrich the general body of knowledge.

Conclusion

The current literature review has demonstrated the value of SNS for media research. Inevitably, some research might have slipped through the net in our search, but we believe the search strategy of this study has captured the relevant sources in the field and the sample reviewed is representative. We can use it as a window to look at the whole picture of current SNS research. As shown in the review above, communication scholars have taken various approaches to conceptualize and analyze SNS in the past half-decade. The scholarly work has successfully enriched the knowledge of academia, industry, and the public. The relational and psychological impacts of SNS have been popular concerns in the field in the past six years. These studies looked into the ways in which SNS provide the social glue that keeps the community alive and interesting. However, in light of the evolving definition of SNS, its ever-changing capabilities, and the patterns found above from the identified articles, there is much that remains to be done. Due to the complex and developing features of SNS, the improvement of measurements requires a clearer definition and more systematic and theory-based empirical research design. It is suggested that future studies take more effort to further investigate the “visualizing” feature of SNS and their network structural implications. More research is needed to test causal relationships and embody the social network structures in order to clearly differentiate among antecedents, uses (process), and consequences of SNS. Further, innovative data collection methods that can minimize the sampling bias found in current studies are also highly recommended.

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