**Online Social Network Sites
and the Concept of Social Capital**

Charles Steinfield, Nicole Ellison, Cliff Lampe, and Jessica Vitak
Department of Telecommunication, Information Studies & Media
Michigan State University

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School of Journalism and Mass Communication
Chinese University of Hong Kong

1. Introduction

During the past decade usage of online social network sites has grown dramatically, now rivaling search engines as the most visited Internet sites (Experian Hitwise, 2010). With the rise of such mega-sites as Facebook, which by itself now boasts more than 400 million active users around the world (Facebook Press Room, 2010), online social network use has become a fixture in the lives of a large proportion of the world's 1.8 billion Internet users (Internet World Stats, 2010). Growing evidence from analyses of online social network site use suggests that these sites have become important tools for managing relationships with a large and often heterogeneous network of people who provide social support and serve as conduits for useful information and other resources (boyd & Ellison, 2007; Ellison et al., 2007). Such SNS benefits are derived from social relationships and have been broadly conceptualized as social capital outcomes of SNS use (Ellison et al., 2007). Beyond identifying benefits, new research explores the factors that lead to improved outcomes for SNS users (Burke et al., 2010; Ellison et al, 2010). Given the pervasive use of social network sites (SNSs), there is a need for a careful assessment of the ways in which users incorporate these tools into their daily lives and obtain benefits from use. The goals of the paper are therefore to review the broad themes from this body of work, and to examine the underlying mechanisms through which social capital benefits are generated. By exposing such mechanisms, we will be better prepared to educate future users about usage strategies, as well as aid designers who are adding social features to many new forms of online media.

The remainder of this paper is organized as follows. First, social network sites are briefly introduced and defined, so as to differentiate them from other forms of online communities. The paper then introduces the notion of social capital and summarizes key findings from research exploring the linkages between social capital and the Internet. We then review the literature investigating the social capital implications of online social network sites. As part of this review, we explore the underlying mechanisms that can explain how social network sites contribute to social capital formation. The paper concludes with suggestions for future research.

2. Defining Social Network Sites
Many web sites contain social features such as user profiles or the ability to post comments on other users' content. These features, however, do not make a site a social network site in and of themselves. The term social network site broadly is used to refer to Web sites that enable users to articulate a network of connections of people with whom they wish to share access to profile information, news, status updates, comments, photos, or other forms of content. boyd & Ellison (2007) assert that SNSs have three essential components: 1) a user-constructed public or semi-public profile, 2) a set of connections to other users within the system, and 3) the ability to view one's own list of connections, as well the connections made by others in the system. Indeed researchers consider the public displays of connections to be a crucial feature of SNSs differentiating them from most other forms of social media (boyd & Ellision, 2007; Donath & boyd, 2004). Beyond these basic capabilities, SNSs differ in a wide variety of ways, including how profiles are constructed (e.g., what fields are provided for users to describe themselves?), how connections are made (e.g., are they reciprocal or can they be asymmetric?), what other communication features are available (e.g., support for private vs. public messaging), and how customizable the pages are from a "look and feel" perspective (boyd & Ellison (2007).

Hundreds of SNSs have been created, but today, Facebook is by far the largest in terms of the number of users, eclipsing MySpace in global unique visits to its Web site in April of 2008 (Arrington, 2008). As such, it has been the focus of much of the research examining the impacts of SNS use.

Research on use of social network sites has proliferated in recent years, which is not surprising given their rapid adoption by users around the world. An earlier review of research on SNS use by boyd & Ellison (2007) outlined four broad areas of work:
- Impression management and friendship performance. Research here is concerned with how users construct online identities, how users manipulate SNS profiles, and how aspects of profiles, including images of friends influence friendship formation and others' impressions of SNS users (boyd, 2008; boyd & Heer, 2006; Marwick, 2005; Tong et al., 2008; Walther et al., 2008).
- Networks and network structure. Research in this area looks at the structure of networks, with insights into network structure and visualizations made possible by the availability of link data in SNSs (Hogan, 2008; Liben-Nowell et al., 2005)
- Bridging online and offline networks. This work, expanded upon below, largely explores the nature of ties in SNSs, with many studies arguing that sites like Facebook are used to maintain or extend connections to existing offline relationships (Choi, 2006; Ellison et al., 2007; Lampe et al., 2006).
- Privacy. Researchers in this area have focused on the extent to which SNS users reveal personal information, exposing themselves to such problems as identity theft (Gross & Acquisti, 2005). Additional work attempts to explain why users are willing to reveal such information in SNS sites, when they might otherwise seek to protect their privacy elsewhere on the Internet (Acquisti & Gross, 2006; Dwyer et al., 2007; Stutzman, 2006).

A focus of much of the research on SNSs seeks to explain how users derive benefits from their participation in social network site communities. In particular, this research stream explores how SNSs help users accumulate social capital (Ellison et al, 2007; Steinfield et al., 2008). In the next section, we review this work, while also briefly introducing the notion of social capital and explaining its relevance to the study of online social network sites.

3. Social Capital and the Internet
The term social capital has been widely used to refer to the accumulated resources derived from the relationships among people within a specific social context or network (Coleman, 1988; Bourdieu, 2001, Lin, 2001; Portes, 1998; Putnam, 2000). Although some have expressed concern that the concept lacks theoretical and operational rigor - for example, Portes (1998) notes that conceptualizations of social capital can alternatively refer to the mechanisms that generate it (relationships), or the outcomes - the sheer volume of work on social capital in many different disciplines over the past three decades suggests its potential utility (Adler & Kwon, 2002).

Two frequent debates in the literature involve whether social capital is an individual or a collective level phenomenon (Lin, 2001), or is the result of having an abundance of strong or weak ties (Burt, 2000). Regarding the former issue, Putnam (2000), tends to view social capital as a community-level quality, and laments its decline in communities across the United States. However, other sociologists like Bourdieu (2001), although conceptualizing social capital as a quality of a collective, suggest that individuals possess varying quantities of it by virtue of being qualified members of the collective. This enables individuals to access the group for favors of varying sorts, thereby *converting* social capital into economic capital. Bourdieu theorizes that, "The volume of social capital possessed by a given agent thus depends on the size of the network of connections he can effectively mobilize and on the volume of the capital possessed in his own right by each of those to whom he is connected." (p. 103). This process requires *investment* in social relations over time, as pointed out again by Bourdieu: "...other [goods and services] can be obtained only by virtue of a social capital of relationships that cannot act instantaneously ... unless they have been maintained for a long time ... at the cost of an investment in sociability ..." (p. 106).

This instrumental notion of individual investment is central to later work on social capital by Lin (2001), who sees as its central premise that individuals pursue "investment in social relations with expected returns" with the idea that "individuals engage in interactions and networking in order to produce profits." (p. 6). According to Lin, resources embedded in social relations enhance outcomes by facilitating the flow of information (e.g. about opportunities), exerting influence (e.g. hiring a friend of a friend), clarifying social credentials (e.g. signifying that someone does indeed have access to resources stemming from a group that stands behind them), and reinforcing identity and recognition that can contribute to an individual's sense that the social group is there to provide emotional support.

The debate over whether social capital derives from a dense network of strong relationships, or from a looser set of weak ones can be traced back to Granovetter's (1973) conceptualization of the strength of weak ties. Granovetter (1973) examined the notion of

tie strength, which he defined as a combination of the amount of time, emotional intensity, intimacy, and reciprocity in a given relationship. He argued that weak ties are more likely to promote the diffusion of non-redundant information, as each tie is likely to be connected to others who are not also directly connected to a particular person. On the other hand, that person's strong ties are likely to be connected to each, suggesting that much of the information flowing through this close-knit network of relationships is redundant.

Later work by Putnam (2000) conceptualized two distinct forms of social capital - one emanating from weak ties that he called bridging social capital, and a second that is derived from strong or intimate ties like family relations, called bonding social capital. Bridging social capital is more suited to information diffusion, and is created through exposure to a heterogeneous network of largely weak ties. Bonding social capital represents the kinds of benefits that arise from close relationships within an exclusive group - family and close friends - and is linked to emotional and social support as well as substantive tangible support like financial loans.

Because the Internet provides individuals with new ways to interact with others – including others ranging from close contacts to relative strangers - researchers have asked how Internet use influences social capital, and whether there are distinctions between online and offline social capital (Resnick, 2001; Wellman and Gulia, 1999; Williams, 2006). Ellison et al., (2010) review prior studies of Internet use and social capital, concluding that there are three distinct types of findings found in the literature: 1) Internet use promotes social capital formation, 2) Internet use can diminish social capital, and 3) Internet use reinforces offline interactions and can supplement social capital development. In the first case, a number of studies have found that greater Internet use is associated with the formation of meaningful relationships and enhanced connection to both online and offline communities of people (Best & Krueger, 2006; Hampton & Wellman, 2002; Rheingold, 1993; Wellman & Julia, 1999).

A contrasting view can be found in studies by Kraut et al., (1998) and Nie (2001), who suggest that time spent interacting with people online replaces time spent in face-to-face interactions with local contacts. The general argument is that distant and online contacts are not able to provide the same types of social support as physically proximate ones.

Finally, the third, more nuanced view, sees the Internet not as a substitute for other forms of interaction, but as a supplement, serving in an additive role when combined with other methods of communication (Quan Haase & Wellman, 2004; Uslaner, 2000). This third perspective directs our attention to the affordances of diverse services on the Internet, such as the ability to remove barriers of distance and time, expand reach, manage dependencies (e.g. through calendars), preserve a history of interactions, and reify groups though naming that, when combined with other forms of communication, can enhance social capital by decreasing the costs of forming and maintaining relationships (Resnick, 2001).

4. Social Network Sites and Social Capital: Themes from Research Findings
Online social network sites, because of their focus on relationship formation and maintenance, have been extensively studied through the lens of social capital. Three consistent themes are evident across much of the SNS research:

1. The types of identity information and information disclosure on SNSs influences usage and outcomes, and research confirms that there are benefits that accompany such information disclosure (Burke et al., 2009; Burket et al., 2010; DiMicco & Millen, 2007; 2008; Donath & boyd, 2004; Dwyer et al., 2007; Dwyer et al., 2008; Lampe et al., 2006; 2007; Mazur et al., 2009).

2. There are distinct forms of social capital benefits associated with SNS use, largely divided into bonding social capital - encompassing various forms of social support from strong ties such as close friends and family; and bridging social capital - encompassing exposure to information and resources from weak ties such as co-workers, classmates, and acquaintances (Ellison et al., 2007; Ellison et al., 2009; Steinfield et al., 2008; Steinfield et al., 2009).

3. SNSs blend online and offline behavior, rather than operating as distinct arenas for social action (Ellison et al., 2007; Ellison et al., 2009; Ellison et al., 2010; Lampe et al., 2006; 2007; 2008; Mayer & Puller, 2007; Steinfield et al., 2009; Subrahmanyam et al., 2008). Hence it is important to view interactions with others in online and offline contexts as part of an integrated set of communication practices.

Identity and Information Disclosure in SNS. Despite all of the privacy concerns that accompany use of SNSs (Gross & Acquisti, 2005; Acquisti & Gross, 2006; Lenhart & Madden, 2007), the available research argues that without the information disclosures in profiles and through other services of SNSs, including status updates, comments, and the display of one's network of connections, users are less likely to accrue benefits. As pointed by Ellison et al. (2010), the information provided in SNS profiles can lower the barriers to initial interaction and facilitate formation of common ground. Such information can include contact information, background data, personal characteristics such as favorite music, films or other preference and taste indicators, and photographs (boyd & Ellison, 2007). Studies indicate that trust and willingness to share information were higher on a site that required actual identities – Facebook, than on a site that did not – MySpace (Dwyer et al., 2007). In addition, greater information disclosure appears to enhance perceptions by others than a user is credible (Mazur et al., 2009).

In their review of the impact of profile information, Ellison et al., (2010) conclude that access to personal identity information supports relationship-formation. Supporting this was evidence in workplace use of SNSs that profile information helps people engage in "people sensemaking," the process of understanding "who someone is and to determine how and why that user should interact with someone" (DiMicco & Millen, 2008, p. 1). The identity information in the profile assists individuals in finding common ground and thus facilitates communication and coordination processes (Clark & Brennan, 1991; Olson & Olson, 2001). Previous scholarship on SNSs suggests that profile information in Facebook may help users find common ground with one another (DiMicco & Millen, 2007; Dwyer et al., 2008; Lampe et al., 2007). In the Lampe et al. (2007) study, profile elements were grouped into three distinct categories: 1) referent information included fields highlighting

information useful in establishing common ground based on offline indicators such as hometown, school, major, and campus residence, 2) interest information included various preferences and tastes in music, films and the like, and 3) contact information included phone, email, instant message names, web site, and similar indicators for facilitating a connection. In a multivariate analysis, Lampe et al., (2007) found that the more users completed information in each of these profile categories, the greater the size of a person's network, illustrating that information disclosure aids in forming connections. Interesting, the information hardest to "fake" – referent information – was the strongest predictor of number of friends, lending further support to the notion that actual identity information is valued in the SNS context.

The display of friend networks may actually serve to enhance the accuracy of information disclosure in SNSs. As noted by Ellison et al. (2010), SNS profiles are less likely to contain the deceptive self-presentation sometimes found in other online contexts, such as online dating sites (Toma, Hancock, & Ellison, 2008), because the visible social network serves as a warrant for users' profile content (Walther, Van Der Heide, Hamel, & Shulman, 2009) and increases the trustworthiness of self-presentation in SNSs (Donath, 2007).

Recent research exploring how user activity on influences overall outcomes on social network sites adds to the basic idea that some disclosure is needed, including dynamic disclosure beyond entering information into profile fields. Burke et al. (2010), obtained both server level and survey data from a large (N=1193) sample of Facebook users. Their study confirmed that users who were actively engaged with Facebook had higher levels of social capital and other measures of well-being. They identified a pattern of usage they labeled "consumption;" essentially this referred to users who clicked on friends sites, but did not contribute content themselves. This type of use did not result in greater social capital, and, in fact, was associated with increased loneliness. On the other hand, users who posted often and engaged in directed communication with friends reported higher bonding social capital.

In summary, the available research on SNS use suggests that the provision of actual identity information, and the information disclosures on social network sites are key to their successful functioning, facilitating relationship initiation, development, and maintenance that permits the establishment of bridging and bonding social capital.

Bridging vs. Bonding Social Capital in Social Network Sites. A series of studies, mainly, but not exclusively conducted with college students using Facebook, finds that greater use of this SNS is associated with greater perceived amounts of bridging and bonding social capital (Ellison et al., 2007; Ellison et al., 2009; Steinfield et al., 2008; Steinfield et al., 2009). In order to assess bridging social capital, a scale was developed based upon a subset of measures formulated by Williams (2006), which, in turn was derived from Putnam's (2000) conceptualization. The thrust of the bridging social capital scale is that respondents feel that they are connected to and willing to give time and energy to a larger group of people beyond their small circle of contacts. The items comprising the scale included the extent to which respondents felt that they were interested in, liked, and were a part of the local community; and that interacting with people in this community made them want to

try new things, feel that they were part of a larger community, and feel that everyone in the world was connected. Additionally, the scale included an item reflecting the extent to which respondents came into contact with new people, as well as two additional items that reflected their willingness to contribute to the community, both financially and in terms of their willingness to spend time to support activities in the community.

The bonding social capital scale likewise was adapted from Williams (2006), tracing its origins to Putnam (2000). It captured the extent to which respondents felt that there were people they could turn to in a time of need within their community for such matters as providing a significant loan, a job reference, to help solve a problem, or to help with other important matters.

In the original Ellison et al. (2007) study, the key finding was that after controlling for a number of factors that might explain differences in respondents' social capital, such as year in school, ethnicity, membership in a fraternity or sorority, various measures of psychological well-being, and even general Internet use, the intensity of Facebook use was a significant predictor of both bridging and bonding social capital. Moreover, the effect was greatest for those lower in self-esteem, leading the authors to conclude that use of the SNS appeared to be lowering the barriers to forming and maintaining productive relationships for people who otherwise may have difficulties socially. The relationships were stronger for bridging than bonding social capital, however.

In a follow-up study, using data collected on a panel of respondents measured over a two-year period, Steinfield et al. (2008), extended these findings to demonstrate that the relationship between SNS use and bridging social capital endured over time. Greater intensity of Facebook use in year one was associated with higher bridging social capital in year two. Moreover, in an effort to tease apart the causal direction of the relationship, these researchers investigated whether the data was consistent with a rival explanation: that those with greater social capital simply have more reasons to use an SNS, with pre-existing social capital driving SNS use. The data did not support this interpretation at all, as those with greater bridging social capital in year one did not use Facebook more intensely in year two. Hence, this study suggests that the causal direction is from SNS use to bridging social capital outcomes.

A third study by this research group further explored the ways in which Facebook use contributed to bridging and bonding social capital (Ellison et al., 2009), through an investigation into specific aspects of use that associated with higher social capital outcomes. We explore this finding in greater depth shortly; at this point we note that having greater numbers of what Ellison et al. (2009) call "actual friends," as opposed to the total friend count on the SNS, as well as using the site in a manner aimed at interacting with people with whom respondents had some form of offline connection, were predictive of both bridging and bonding social capital. Once again, the relationships for bridging social capital were stronger than for bonding social capital.

Finally, because of the growing use of SNSs outside of student populations, research has also begun to explore social capital implications of SNSs in other contexts such as in the

workplace. Steinfield et al. (2009) conducted a study in a large, multinational company that had built its own internal SNS. The social capital items were broadened and adapted to fit a multinational organizational environment. Bridging included subscales tapping into four types of outcomes relevant to this context: 1) the extent to which employees had access to new people at work, 2) access to information and expertise that would be helpful in their jobs, 3) citizen as measured by their willingness to contribute in various ways to the company, and 4) interest in connecting with other cultures in the company. The findings were consistent with prior studies – SNS usage was associated with both greater bonding social capital and these four dimensions of bridging, controlling for a range of organizational demographic variables including management level, experience in the company, type of job, division, and geographic location of the employee. The consistency and strength of the effect was all the more remarkable considering that the internal SNS was fairly new and usage rates were modest.

In summary, the research in this area consistently supports the notion that SNSs can contribute to the formation and maintenance of both forms of social capital: those involving connections to a larger, heterogeneous network of weak ties that can be conduits for information diffusion, and those involving connections to stronger ties that can provide emotional, and important material support. However, in studies where both dependent variables were investigated, the effects have been stronger for bridging than bonding social capital.

Offline and Online Behavior with Social Network Sites. Early research on the Internet and computer-mediated communication (CMC) often focused on the ability it afforded users to interact with people outside their normal circle of contacts, with connections based on shared interest rather than geography (Rheingold, 1993). This emphasis can also be seen in studies that argue that interactions on the Internet replace offline interactions, weakening heavy Internet users' offline relationships (Nie, 2001). Williams (2006) argues that social capital may be formed differently online than offline, and developed scales specifically for measuring online social capital.

Ellison et al. (2010) note that one common narrative in CMC research involves the formation of relationships that begin online, but that later involve in-person meetings. For example, in a study of online relationship development, Parks and Floyd (1996) report that one-third of their respondents later met their online correspondents face-to-face. This online-to-offline interaction can also be found in online dating sites such as Match.com (Ellison et al., 2010).

In the context of online social network sites, much of the anxiety about privacy is linked to fears that users are connecting with strangers and divulging too much personal information (Lenhart & Madden, 2007). However, the evidence from numerous SNS studies suggests that users are more likely to connect with people they already know, or have some offline basis for the connection, while connections with total strangers is relatively uncommon. Lenhart & Madden (2007) note, for example, that 91% of teens report connecting with existing friends. Mayer & Puller (2007) examined friend lists on Facebook at ten different universities using a Facebook feature where users report how

they met their "friends". Only 0.4% reported friends that were merely online interactions – most reported that the basis of the friendship was linked to an offline context such as being in the same school organization, having met through a mutual friend, having attended the same high school, or having taken a course together. Subrahmanyam et al. (2008) similarly found that most SNS users used the site to connect and re-connect with friends and family members.

A series of studies of Facebook users at one large Midwestern university further supports the offline to online direction for the establishment of SNS connections. Lampe et al. (2006) found little agreement from respondents with statements saying that they used Facebook to meet new people or find people to date, but high agreement with statements saying that they used Facebook to keep in touch with old friends or check out someone they had met socially. A later analysis across three consecutive years of data revealed that this pattern of use was consistent over time (Lampe et al., 2008).

Is this offline to online pattern implicated in the extent to which users receive social capital benefits from their participation in SNSs? Evidence from recent research suggests that this is, indeed, the case. Much of the prior research examined how frequency and intensity of SNS use was related to bridging and bonding social capital. However, Ellison et al. (2009) extended this work by investigating what types of usage behaviors were more likely to be associated with social capital outcomes among Facebook users. In particular, they identified the following three distinct usage patterns, which they collectively called "connection strategies."
- *Maintaining* reflected use of the SNS to connect with existing close ties. It was measured by a series of items asking to what extent respondents were browsing their close friends' profiles, contacting them through Facebook, "friending" them, and meeting them face-to-face.
- *Information seeking* reflected use of Facebook to learn more about and connect with people who were not close friends, but with whom respondents had some form of offline connection. Measures include the extent to which respondents used the site to check out someone they had met socially, learn more about people in their classes or people living near to them, and browse the profiles of people in their residence hall.
- *Initiating* reflected an online to offline pattern of connection, involving use of Facebook to connect with strangers or meet new people. Measures included the extent to which respondents browsed, contacted, friended, or met strangers at their university, and used Facebook to meet new people.

In line with the many prior studies that have found that users are more likely to connect with people they already knew or with whom they have some offline connection, respondents reported the greatest amount of maintaining as a connection strategy, followed by information seeking, and then initiating. Regression analyses revealed that only the information seeking approach was associated with bridging and bonding social capital. Additionally, Ellison et al. (2009) asked respondents to indicate how many of their total Facebook friends they considered to be *actual* friends. The number of actual friends was associated with both forms of social capital, while the total number of friends was not.

It is worth noting that the median number of actual friends was 75, which seems too large to be considered a core group of intimate contacts. Overall explained variance was greater for bridging than bonding social capital, providing further support for the idea that SNSs make a difference in users' access to social capital by enabling the maintenance of a large heterogeneous network of weak ties. Bonding social capital requires access to strong ties, and there are likely to be many other channels of communication with these types of individuals, mitigating any added effect of SNSs (Ellison et al., 2010).

Further evidence that an offline to online pattern of connection is more likely to result in social capital benefits comes from Steinfield et al. (2009), in their study of SNS use in the workplace. In addition to measuring intensity of SNS use, these researchers developed two indices that assessed the extent to which respondents used the SNS to connect with existing and former work contacts vs. new people they had never met in person. After controlling for intensity of system use as well as other demographic and organizational variables, the use of the SNS for connecting with existing contacts predicted bonding social capital and three of the four types of bridging social capital in their study: access to expertise, access to new people, and corporate citizenship. Only one form of bridging social capital was not associated with this usage strategy: interest in global connections. This was higher among employees who used the system for meeting new people.

In summary, the literature supports the view that SNS users are more likely to connect with their existing offline relations – people with whom they are likely to interact via other media (Haythornthwaite, 2005). Moreover, the offline to online pattern of usage appears to be associated with higher social capital outcomes. Viewing SNS use as part of an integrated set of communication activities may lead researchers to new types of questions, such as how various types of interactions in the SNS (comments, status updates, messages, etc.) affect offline communication among a network of friends.

5. Discussion and Conclusions

Among the many new forms of interaction made possible by the Internet, it would be difficult to find any other services that have experienced such rapid growth as online social network sites. Sites such as Facebook and MySpace are among the most visited Web sites in many countries. This paper has provided a detailed review of research on social network site use, focusing on the ways in which users benefit from them, primarily through the lens of social capital as an outcome. We highlighted three broad themes evident in this body of work. First, SNSs are different from other types of online communities, in that, in most SNSs, users are asked to reveal personal identities and disclose considerable information about themselves. However, this disclosure, while raising concerns about privacy, also appears to be essential for the functioning of the site and for enabling the kinds of relationship developments that result in bridging and bonding social capital benefits. Second, SNS use is associated with increases in users' perceptions of both their bridging and bonding social capital, with generally greater increases in bridging social capital. Third, users appear to be primarily connecting with people they already know or have some form of offline connection on social network sites, and this pattern of use is more likely to result in higher perceived social capital than if users rely on SNSs to initiate contacts with new people.

The technical affordances of SNSs interact with usage patterns to facilitate social capital generation. Following Ellison et al. (2010), the features built into SNSs serve to reduce the costs that individuals face in building a larger and more heterogeneous network of strong and weak ties. The presence of searchable profile information and the ability to view friends of friends lower the costs of finding close friends as well as casual acquaintances, and for establishing common ground among potential connections. Such large and diverse networks are sources of new information that might otherwise not be available to users. In addition, the lightweight interactions made possible by such features as newsfeeds lowers the costs of maintaining all of the weak ties formed on the SNS, meaning that connections that might have otherwise faded away over time can remain vital. Rich interaction such as sharing photos and chatting among friends also can enhance and sustain strong ties that are a source of bonding social capital.

Of course, not all SNS use is positive. People can say hurtful things about others, predators can stalk unwitting users, individuals can lose their jobs or face other penalties when they post inappropriate content, and companies can invade users privacy in their efforts to market products and services using data from SNSs. Yet, our review has demonstrated the potential for positive outcomes, and suggested usage strategies that may yield benefits.

Although there is now a large body of work on the social capital implications of SNSs, many research issues remain. Among the many possible directions for future research related to SNSs and social capital, we suggest the following to fill in gaps and extend the work that has been done to date:
1. Develop better measures of SNS usage. The Ellison et al. (2007) Facebook Intensity Scale has been widely used, but may not reveal nuances in usage behavior that can explain why some people benefit while others do not. Innovations such as measuring new connection strategies (Ellison et al. (2009), and the use of server level data to distinguish directed communication from consumption (Burke et al., 2010) are examples of directions to go with measuring SNS usage. Other new directions involve measuring the contexts of usage, such as whether usage is occurring at home, or when a user is out and about with a mobile device.
2. Improve measurement of social capital. Existing measures of bridging and bonding social capital can be extended to measure actual benefits received rather than the current focus of the scales, which emphasizes the potential for future benefit.
3. Develop better strategies to ascertain causal directions. The Steinfield et al. (2008) panel study is one approach to determining causal directions. Experimental work may also help to tease apart when and how usage of SNSs facilitates social capital development.
4. Investigate other populations of users beyond students. The vast majority of studies have been conducted with students, given the high usage rate among this population and the easier access to samples. Works by Burke et al. (2010), DiMicco & Millen (2008), and Steinfield et al. (2009) are a start, but many more studies of specific populations (e.g. seniors) or specific contexts (e.g. government workers) are needed. Comparisons across cultures are also needed.

5. Explore the social capital implications that result from people migrating from one social network site to another, or leaving an SNS altogether. What happens when people move organizations, and have to leave a company SNS, or when people drop out of Facebook? What steps do they take to compensate for the potential loss of social capital?

As the Internet turns 40, the use and impacts of online social network sites has become a vital new research area. We expect interest to continue to grow, especially as sites like Facebook extend the social web across the Internet to many other types of sites.

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