The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites

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Abstract

This study examines the relationship between use of Facebook, a popular online social network site, and the formation and maintenance of social capital. In addition to assessing bonding and bridging social capital, we explore a dimension of social capital that assesses one's ability to stay connected with members of a previously inhabited community, which we call maintained social capital. Regression analyses conducted on results from a survey of undergraduate students (N=286) suggest a strong association between use of Facebook and the three types of social capital, with the strongest relationship being to bridging social capital. In addition, Facebook usage was found to interact with measures of psychological well-being, suggesting that it might provide greater benefits for users experiencing low self-esteem and low life satisfaction.

Introduction

Social network sites (SNSs) such as such as Friendster, CyWorld, and MySpace allow individuals to present themselves, articulate their social networks, and establish or maintain connections with others. These sites can be oriented towards work-related contexts (e.g., LinkedIn.com), romantic relationship initiation (the original goal of Friendster.com), connecting those with shared interests such as music or politics (e.g., MySpace.com), or the college student population (the original incarnation of Facebook.com). Participants may use the sites to interact with people they already know offline or to meet new people. The online social network application analyzed in this article, Facebook, enables its users to present themselves in an online profile, accumulate "friends" who can post comments on each other's pages, and view each other's profiles. Facebook members can also join virtual groups based on common interests, see what classes they have in common, and learn each others' hobbies, interests, musical tastes, and romantic relationship status through the profiles.

Facebook constitutes a rich site for researchers interested in the affordances of social networks due to its heavy usage patterns and technological capacities that bridge online and offline connections. We believe that Facebook represents an understudied *offline to online* trend in that it originally primarily served a geographically-bound community (the campus). When data were collected for this study, membership was restricted to people with a specific host institution email address, further tying offline networks to online membership. In this sense, the original incarnation of Facebook was similar to the wired Toronto neighborhood studied by Hampton and Wellman (e.g., Hampton, 2002; Hampton & Wellman, 2003), who suggest that information technology may enhance place-based community and facilitate the generation of social capital.[1] Previous research suggests that Facebook users engage in "searching" for people with whom they have an offline connection more than they "browse" for complete strangers to meet (Lampe, Ellison, & Steinfield, 2006).

Online SNSs support both the maintenance of existing social ties and the formation of new connections. Much of the early research on online communities assumed that individuals using these systems would be connecting with others outside their pre-existing social group or location, liberating them to form communities around shared interests, as opposed to shared geography (Wellman, Salaff, Dimitrova, Garton, Gulia, & Haythornthwaite, 1996). A hallmark of this early research is the presumption that when online and offline social networks overlapped, the directionality was *online to offline*—online connections resulted in face-to-face meetings. For instance, Parks and Floyd (1996) report that one-third of their respondents later met their online correspondents face-to-face. As they write, "These findings imply that relationships that begin on line rarely stay there" (n.p.).

Although this early work acknowledged the ways in which offline and online networks bled into one another, the assumed online to offline directionality may not apply to today's SNSs that are structured both to articulate existing connections and enable the creation of new ones. However, because there is little empirical research that addresses whether members use SNSs to maintain existing ties or to form new ones, the social capital implications of these services are unknown.

An Overview of Facebook

Created in 2004, by 2007 Facebook was reported to have more than 21 million registered members generating 1.6 billion page views each day (Needham & Company, 2007). The site is tightly integrated into the daily media practices of its users: The typical user spends about 20 minutes a day on the site, and two-thirds of users log in at least once a day (Cassidy, 2006; Needham & Company, 2007). Capitalizing on its success among college students, Facebook launched a high school version in early September 2005. In 2006, the company introduced communities for commercial organizations; as of November 2006, almost 22,000 organizations had Facebook directories (Smith, 2006). In 2006, Facebook was used at over 2,000 United States colleges and was the seventh most popular site on the World Wide Web with respect to total page views (Cassidy, 2006).

Much of the existing academic research on Facebook has focused on identity presentation and privacy concerns (e.g., Gross & Acquisti, 2005; Stutzman, 2006). Looking at the amount of information Facebook participants provide about themselves, the relatively open nature of the information, and the lack of privacy controls enacted by the users, Gross and Acquisti (2005) argue that users may be putting themselves at risk both offline (e.g., stalking) and online (e.g., identify theft). Other recent Facebook research examines student perceptions of instructor presence and self-disclosure (Hewitt & Forte, 2006; Mazer, Murphy, & Simonds, 2007), temporal patterns of use (Golder, Wilkinson, & Huberman, 2007), and the relationship between profile structure and friendship articulation (Lampe, Ellison, & Steinfield, 2007).

In contrast to popular press coverage which has primarily focused on negative outcomes of Facebook use stemming from users' misconceptions about the nature of their online audience, we are interested in situations in which the intended audience for the profile (such as well-meaning peers and friends) and the actual audience are aligned. We use Facebook as a research context in order to determine whether offline social capital can be generated by online tools. The results of our study show that Facebook use among college-age respondents was significantly associated with measures of social capital.

Literature Review

Social Capital: Online and Offline

Social capital broadly refers to the resources accumulated through the relationships among people (Coleman, 1988). Social capital is an elastic term with a variety of definitions in multiple fields (Adler & Kwon, 2002), conceived of as both a cause and an effect (Resnick, 2001; Williams, 2006). Bourdieu and Wacquant (1992) define social capital as "the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 14). The resources from these relationships can differ in form and function based on the relationships themselves.

Social capital has been linked to a variety of positive social outcomes, such as better public health, lower crime rates, and more efficient financial markets (Adler & Kwon, 2002). According to several measures of social capital, this important resource has been declining in the U.S. for the past several years (Putnam, 2000). When social capital declines, a community experiences increased social disorder, reduced participation in civic activities, and potentially more distrust among community members. Greater social capital increases commitment to a community and the ability to mobilize collective actions, among other benefits. Social capital may also be used for negative purposes, but in general social capital is seen as a positive effect of interaction among participants in a social network (Helliwell & Putnam, 2004).

For individuals, social capital allows a person to draw on resources from other members of the networks to which he or she belongs. These resources can take the form of useful information, personal relationships, or the capacity to organize groups (Paxton, 1999). Access to individuals outside one's close circle provides access to non-redundant information, resulting in benefits such as employment connections (Granovetter, 1973). Moreover, social capital researchers have found that various forms of social capital, including ties with friends and neighbors, are related to indices of psychological well-being, such as self esteem and satisfaction with life (Bargh & McKenna, 2004; Helliwell & Putnam, 2004).

Putnam (2000) distinguishes between bridging and bonding social capital. The former is linked to what network researchers refer to as "weak ties," which are loose connections between individuals who may provide useful information or new perspectives for one another but typically not emotional support

(Granovetter, 1982). Alternatively, bonding social capital is found between individuals in tightly-knit, emotionally close relationships, such as family and close friends. After briefly describing the extant literature on these two forms of social capital and the Internet, we introduce an additional dimension of social capital that speaks to the ability to maintain valuable connections as one progresses through life changes. This concept, "maintained social capital," permits us to explore whether online network tools enable individuals to keep in touch with a social network after physically disconnecting from it.

Social Capital and the Internet

The Internet has been linked both to increases and decreases in social capital. Nie (2001), for example, argued that Internet use detracts from face-to-face time with others, which might diminish an individual's social capital. However, this perspective has received strong criticism (Bargh & McKenna, 2004). Moreover, some researchers have claimed that online interactions may supplement or replace in-person interactions, mitigating any loss from time spent online (Wellman, Haase, Witte, & Hampton, 2001). Indeed, studies of physical (e.g., geographical) communities supported by online networks, such as the Netville community in Toronto or the Blacksburg Electronic Village, have concluded that computer-mediated interactions have had positive effects on community interaction, involvement, and social capital (Hampton & Wellman, 2003; Kavanaugh, Carroll, Rosson, Zin, & Reese, 2005).

Recently, researchers have emphasized the importance of Internet-based linkages for the formation of weak ties, which serve as the foundation of bridging social capital. Because online relationships may be supported by technologies like distribution lists, photo directories, and search capabilities (Resnick, 2001), it is possible that new forms of social capital and relationship building will occur in online social network sites. Bridging social capital might be augmented by such sites, which support loose social ties, allowing users to create and maintain larger, diffuse networks of relationships from which they could potentially draw resources (Donath & boyd, 2004; Resnick, 2001; Wellman et al., 2001). Donath and boyd (2004) hypothesize that SNSs could greatly increase the weak ties one could form and maintain, because the technology is well-suited to maintaining such ties cheaply and easily.

Based on this prior work, we propose the following hypothesis:

> **H1:** Intensity of Facebook use will be positively associated with individuals' perceived bridging social capital.

In Putnam's (2000) view, bonding social capital reflects strong ties with family and close friends, who might be in a position to provide emotional support or access to scarce resources. Williams (2006) points out that little empirical work has explicitly examined the effects of the Internet on bonding social capital, although some studies have questioned whether the Internet supplements or supplants strong ties (see Bargh & McKenna, 2004, for a review). It is clear that the Internet facilitates new connections, in that it provides people with an alternative way to connect with others who share their interests or relational goals (Ellison, Heino, & Gibbs, 2006; Horrigan, 2002; Parks & Floyd, 1996). These new connections may result in an increase in social capital; for instance, a 2006 Pew Internet survey reports that online users are more likely to have a larger network of close ties than non-Internet users, and that Internet users are more likely than non-users to receive help from core network members (Boase, Horrigan, Wellman, & Rainie, 2006). However, it is unclear how social capital formation occurs when online and offline connections are closely coupled, as with Facebook. Williams (2006) argues that although researchers have examined potential losses of social capital in offline communities due to increased Internet use, they have not adequately explored online gains that might compensate for this. We thus propose a second hypothesis on the relationship between Facebook use and close ties:

> **H2:** Intensity of Facebook use will be positively associated with individuals' perceived bonding social capital.

Online social network tools may be of particular utility for individuals who otherwise have difficulties forming and maintaining both strong and weak ties. Some research has shown, for example, that the Internet might help individuals with low psychological well-being due to few ties to friends and neighbors (Bargh & McKenna, 2004). Some forms of computer-mediated communication can lower barriers to interaction and encourage more self-disclosure (Bargh, McKenna, & Fitzsimons, 2002; Tidwell & Walther, 2002); hence, these tools may enable connections and interactions that would not otherwise occur. For this reason, we explore whether the relationship between Facebook use and social capital is different for individuals with varying degrees of self-esteem (Rosenberg, 1989) and satisfaction with life (Diener, Suh, & Oishi, 1997; Pavot & Diener, 1993), two well-known and validated measures of subjective well-being. This leads to the two following pairs of hypotheses:

H3a: The relationship between intensity of Facebook use and bridging social capital will vary depending on the degree of a person's self esteem.

H3b: The relationship between intensity of Facebook use and bridging social capital will vary depending on the degree of a person's satisfaction with life.

H4a: The relationship between intensity of Facebook use and bonding social capital will vary depending on the degree of a person's self esteem.

H4b: The relationship between intensity of Facebook use and bonding social capital will vary depending on the degree of a person's satisfaction with life.

Maintained Social Capital and Life Changes

Social networks change over time as relationships are formed or abandoned. Particularly significant changes in social networks may affect one's social capital, as when a person moves from the geographic location in which their network was formed and thus loses access to those social resources. Putnam (2000) argues that one of the possible causes of decreased social capital in the U.S. is the increase in families moving for job reasons; other research has explored the role of the Internet in these transitions (Cummings, Lee, & Kraut, 2006; Wellman et al., 2001). Wellman et al. (2001), for example, find that heavy Internet users rely on email to maintain long distance relationships, rather than using it as a substitute for offline interactions with those living nearby.

Some researchers have coined the term "friendsickness" to refer to the distress caused by the loss of connection to old friends when a young person moves away to college (Paul & Brier, 2001). Internet technologies feature prominently in a study of communication technology use by this population by Cummings, Lee, and Kraut (2006), who found that services like email and instant messaging help college students remain close to their high school friends after they leave home for college. We therefore introduce a measure focusing specifically on the maintenance of existing social capital after this major life change experienced by college students, focusing on their ability to leverage and maintain social connections from high school.

Young adults moving to college need to create new networks at college. However, they often leave friends from high school with whom they may have established rich networks; completely abandoning these high school networks would mean a loss of social capital. Granovetter (1973, 1982) has suggested that weak ties provide more benefit when the weak tie is not associated with stronger ties, as may be the case for maintained high school relationships. To test the role of maintained high school relationships as weak, bridging ties, we adapted questions about general bridging relationships, such as those in Williams (2006), to be specific to maintained relationships with high school acquaintances as opposed to close friends. We call this concept "maintained social capital." In keeping with the thrust of our prior hypotheses about the role of Facebook and bridging social capital, we propose the following:

H5: Intensity of Facebook use will be positively associated with individuals' perceived maintained social capital.

Methods

A random sample of 800 Michigan State University (MSU) undergraduate students was retrieved from the MSU registrar's office. All 800 students were sent an email invitation from one of the authors, with a short description of the study, information about confidentiality and incentives, and a link to the survey. Two reminder emails were sent to those who had not responded. Participants were compensated with a $5 credit to their on-campus spending accounts. The survey was hosted on Zoomerang (http://www.zoomerang.com), an online survey hosting site, and was fielded in April 2006. Only undergraduate users were included in our sampling frame. A total of 286 students completed the online survey, yielding a response rate of 35.8% (see Table 1 for sample demographics). Demographic information about non-responders was not available; therefore we do not know whether a bias existed in regards to survey participation. However, when we compare the demographics of our sample to information we have about the MSU undergraduate population as a whole, our sample appears to be representative with a few exceptions. Female, younger, in-state, and on-campus students were slightly overrepresented in our sample.[2]

	Mean or % (N)	S.D.
Gender		
male	34% (98)	
female	66% (188)	

Age	20.1	1.64
Ethnicity		
white	87% (247)	
non-white	13% (36)	
Income[1]	3.18	2.04
Year in school[2]	2.55	1.07
Home residence		
in-state	91% (259)	
out-of-state	09% (25)	
Local residence		
on campus	55% (157)	
off campus	45% (127)	
Member of fraternity/sorotity	08% (23)	1.01
Hours of Internet use per day[3]	2 hr, 56 min	1.52
Facebook members	94% (268)	

Table 1. Sample demographics (N=286)

Notes: [1] represents household income; 1=under $20,000, 2=$20,000-$34,999, 3=$35,000-$49,999, 4=$50,000-$74,999, 5=$75,000 or more; [2] 1=first year, 2=sophomore, 3=junior, 4=senior; [3] converted from ordinal scale using mid-point of response category (e.g., 1-2 hours=1 hour 30 minutes)

Measures

Our instrument included four broad types of measures, which are discussed in more detail below. We collected information about demographic and other descriptive variables, including gender, age, year in school, local vs. home residence, ethnicity, a measure of Internet use adapted from LaRose, Lai, Lange, Love, and Wu (2005), and whether respondents were Facebook members or not. (These items are reflected in Table 1 above.) We also included Facebook usage measures, such as time spent using Facebook and items designed to assess whether Facebook was used to meet new people or to establish an online connection to pre-existing connections. Our instrument also included measures of subjective well-being and as well as three social capital measures, which served as our dependent variables.

Measures of Facebook Usage

Facebook Intensity

The Facebook intensity scale (Cronbach's alpha=.83) was created in order to obtain a better measure of Facebook usage than frequency or duration indices. This measure includes two self-reported assessments of Facebook behavior, designed to measure the extent to which the participant was actively engaged in Facebook activities: the number of Facebook "friends" and the amount of time spent on Facebook on a typical day. This measure also includes a series of Likert-scale attitudinal questions designed to tap the extent to which the participant was emotionally connected to Facebook and the extent to which Facebook was integrated into her daily activities (see Table 2 for item wording and descriptive statistics).

Individual Items and Scale	Mean	S.D.
Facebook intensity[1, 2] (Cronbach's alpha=0.83)	**-0.08**	**0.79**
About how many total Facebook friends do you have at MSU or elsewhere? *0=10 or less, 1=11-50, 2=51-100, 3=101-150, 4=151-200, 5=201-250, 6=251-300, 7=301-400, 8=more than 400*	4.39	2.12
In the past week, on average, approximately how many minutes per day have you spent on Facebook? *0=less than 10, 1=10-30, 2=31-60, 3=1-2 hours, 4=2-3 hours, 5=more than 3 hours*	1.07	1.16
Facebook is part of my everyday activity	3.12	1.26
I am proud to tell people I'm on Facebook	3.24	0.89
Facebook has become part of my daily routine	2.96	1.32
I feel out of touch when I haven't logged onto Facebook for a while	2.29	1.20
I feel I am part of the Facebook community	3.30	1.01
I would be sorry if Facebook shut down	3.45	1.14

Table 2. Summary statistics for Facebook intensity

Notes: [1] Individual items were first standardized before taking an average to create scale due to differing

item scale ranges. [2] Unless provided, response categories ranged from 1=strongly disagree to 5=strongly agree.

Facebook Usage: Elements in Profile and Perceptions of Who Has Viewed Profiles

We asked respondents to indicate which of several salient aspects of the profile (such as relationship status, high school, and mobile phone number) they included when constructing their profile. The instrument asked respondents to indicate who they thought had viewed their profile, such as high school friends, classmates, or family members. These items offer insight into the degree to which respondents used Facebook to maintain existing connections or meet new people.

Use of Facebook to Meet New People vs. Connect with Existing Offline Contacts

In order to further investigate whether usage was more motivated by prior offline contacts or the potential to form new online contacts, we developed several items reflecting each of these paths (see Table 3). In the former case, the items measured whether respondents used Facebook to look up someone with whom they shared some offline connection, such as a classmate or a friend (Cronbach's alpha=.70). In the latter case, our instrument included several items that tapped the use of Facebook to make new friends without any reference to an offline connection, but these did not correlate highly, and our final analysis incorporated only a single item measure: using Facebook to meet new people.

Individual Items and Scale[1]	Mean	S.D.
Off to Online: I use Facebook to connect with offline contacts (Cronbach's alpha=0.70)	**3.64**	**0.79**
I have used Facebook to check out someone I met socially	3.99	1.05
I use Facebook to learn more about other people in my classes	3.26	1.20
I use Facebook to learn more about other people living near me	2.86	1.22
I use Facebook to keep in touch with my old friends	4.42	0.86
On to Offline: I use Facebook to meet new people (single item measure)	**1.97**	**1.03**

Table 3. Summary statistics for Facebook use for prior contacts and meeting new people

Note: [1] Individual items ranged from 1=strongly disagree to 5=strongly agree, scales constructed by taking mean of items.

Measures for Psychological Well-Being

Self-Esteem

Self-esteem was measured using seven items from the Rosenberg self-esteem scale (Rosenberg, 1989). The answers to these questions were reported on a 5-point Likert scale and exhibited high reliability (see Table 4).

Satisfaction with Life at MSU

The scale of satisfaction with life at MSU was adapted from the Satisfaction with Life Scale (SWLS) (Diener, Suh, & Oishi, 1997; Pavot & Diener, 1993), a five-item instrument designed to measure global cognitive judgments of one's life. We amended each item slightly to refer specifically to the MSU context, on the assumption that restricting participants was more appropriate given our hypotheses and more likely to elicit accurate answers. The reliability test for this 5-point Likert scale showed a relatively high reliability (see Table 4).

Individual Items and Scale[1]	Mean	S.D.
Self Esteem Scale (Cronbach's alpha=0.87)	**4.30**	**0.55**
I feel that I'm a person of worth, at least on an equal plane with others	4.50	0.60
I feel that I have a number of good qualities	4.54	0.57
All in all, I am inclined to feel that I am a failure (reversed)	4.27	0.86
I am able to do things as well as most other people	4.29	0.63
I feel I do not have much to be proud of (reversed)	4.26	0.89
I take a positive attitude toward myself	4.17	0.75
On the whole, I am satisfied with myself	4.07	0.84
Satisfaction with MSU Life Scale (Cronbach's alpha=0.87)	**3.55**	**0.74**
In most ways my life at MSU is close to my ideal	3.42	0.96
The conditions of my life at MSU are excellent	3.54	0.91

	Mean	S.D.
I am satisfied with my life at MSU	3.85	0.84
So far I have gotten the important things I want at MSU	3.74	0.81
If I could live my time at MSU over, I would change almost nothing	3.18	1.05

Table 4. Summary statistics and factor analysis results for self-esteem and satisfaction with MSU life items

Note: [1] Individual items ranged from 1=strongly disagree to 5=strongly agree, scales constructed by taking mean of items.

Measures of Social Capital

Our three measures of social capital—bridging, bonding, and maintained social capital—were created by adapting existing scales, with wording changed to reflect the context of the study, and creating new items designed to capture Internet-specific social capital (Quan-Haase & Wellman, 2004). The full set of social capital items was factor analyzed to ensure that the items reflected three distinct dimensions (see Table 5).

Individual Items and Scales[2]	Mean	S.D.	Factor Loadings[1]		
			Bridging Social Capital	Maintained Social Capital	Bonding Social Capital
Bridging Social Capital Scale (Cronbach's alpha=0.87)	**3.81**	**0.53**			
I feel I am part of the MSU community	3.78	0.80	**0.70**	-0.24	0.13
I am interested in what goes on at MSU	3.98	0.64	**0.73**	-0.10	0.13
MSU is a good place to be	4.22	0.78	**0.73**	-0.12	0.18
I would be willing to contribute money to MSU after graduation	3.35	0.95	**0.66**	-0.04	0.13
Interacting with people at MSU makes me want to try new things	3.74	0.68	**0.60**	-0.04	0.15
Interacting with people at MSU makes me feel like a part of a larger community	3.81	0.68	**0.72**	-0.09	0.23
I am willing to spend time to support general MSU activities	3.70	0.77	**0.76**	-0.10	0.16
At MSU, I come into contact with new people all the time	4.05	0.69	**0.54**	-0.17	0.13
Interacting with people at MSU reminds me that everyone in the world is connected	3.65	0.88	**0.60**	-0.07	0.04
Bonding Social Capital Scale (Cronbach's alpha=0.75)	**3.72**	**0.66**			
There are several people at MSU I trust to solve my problems	3.22	1.01	0.17	-0.07	**0.60**
If I needed an emergency loan of $100, I know someone at MSU I can turn to	3.75	1.09	0.02	-0.18	**0.76**
There is someone at MSU I can turn to for advice about making very important decisions	3.98	0.85	0.27	-0.09	**0.76**
The people I interact with at MSU would be good job references for me	3.88	0.79	0.32	0.07	**0.63**
I do not know people at MSU well enough to get them to do anything important (reversed)	3.78	0.87	0.13	-0.23	**0.61**
Maintained Social Capital Scale (Cronbach's alpha=0.81)	**3.77**	**0.67**			
I'd be able to find out about events in another town from a high school acquaintance living there	3.59	0.88	0.20	**-0.58**	0.05
If I needed to, I could ask a high school acquaintance to do a small favor for me	3.92	0.89	0.06	**-0.86**	0.18
I'd be able to stay with a high school acquaintance if traveling to a different city	3.85	0.94	-0.02	**-0.85**	0.15
I'd be able to find information about a job or internship from a high school acquaintance	3.58	0.89	0.11	**-0.79**	0.02
It would be easy to find people to invite to my high school reunion	3.90	0.88	0.29	**-0.56**	0.14

Table 5. Summary statistics and factor analysis results for social capital items

Notes: [1] Principal components factor analysis with varimax rotation, explaining 53% of the variance.
[2] Individual items ranged from 1=strongly disagree to 5=strongly agree, scales constructed by taking mean of items.

Bridging Social Capital

This measure assessed the extent to which participants experienced bridging social capital, which is believed to be better-suited for linking to external assets and for information diffusion (Putnam, 2000). According to Williams (2006), "members of weak-tie networks are thought to be outward looking and to include people from a broad range of backgrounds. The social capital created by these networks generates broader identities and generalized reciprocity" (n.p.). We therefore adapted five items from Williams' (2006) bridging social capital subscale and created three additional items intended to measure bridging social capital in the MSU context to create our bridging social capital scale (Cronbach's alpha=.87). One item, "MSU is a good place to be," was included because it loaded on the same factor and tapped into an outcome of bridging social capital.

Bonding Social Capital

Bonding was assessed using five items from the bonding subscale of the Internet social capital scales developed and validated by Williams (2006). Responses were reported on a five-point Likert scale. These items were adapted to the MSU context (Cronbach's alpha=.75).

Maintained Social Capital

This original scale was inspired by our pilot interviews,[3] media coverage of Facebook, and anecdotal evidence that suggested that keeping in touch with high school friends was a primary use of Facebook. These items were adapted from traditional measures of social capital which assess an individual's ability to mobilize support or action (Cronbach's alpha=.81) but focus on the ability to get assistance from a *previously inhabited* community.

Findings

We first present some basic descriptive data to characterize Facebook users and uses and provide insight into whether Facebook is used more to meet new people or to maintain or strengthen relationships with offline connections. In a short period of time, Facebook has garnered a very strong percentage of users on college campuses. In our sample, 94% of the undergraduate students we surveyed were Facebook members. We investigated whether members and non-members differed significantly along various demographic characteristics, but we lacked confidence in these findings given the extremely low number of non-Facebook users. The remainder of our analyses are based only on data from Facebook members.

Facebook members report spending between 10 and 30 minutes on average using Facebook each day and report having between 150 and 200 friends listed on their profile (Table 2). From Table 3 we see that respondents also report significantly more Facebook use involving people with whom they share an offline connection—either an existing friend, a classmate, someone living near them, or someone they met socially (mean=3.64)—than use involving meeting new people (mean=1.97) (t=26.14, p<.0001).

Further insight into Facebook usage patterns can be gleaned from Figures 1 and 2, which show what elements respondents report including in their Facebook profile and who they believe has seen their profiles, respectively. The fact that nearly all Facebook users include their high school name in their profile (96%) suggests that maintaining connections to former high school classmates is a strong motivation for using Facebook. Not surprisingly, 97% report that high school friends had seen their profile. Ninety percent or more also reported that other friends as well as people in their classes had seen their profile, further suggesting an offline component to Facebook use.[4]
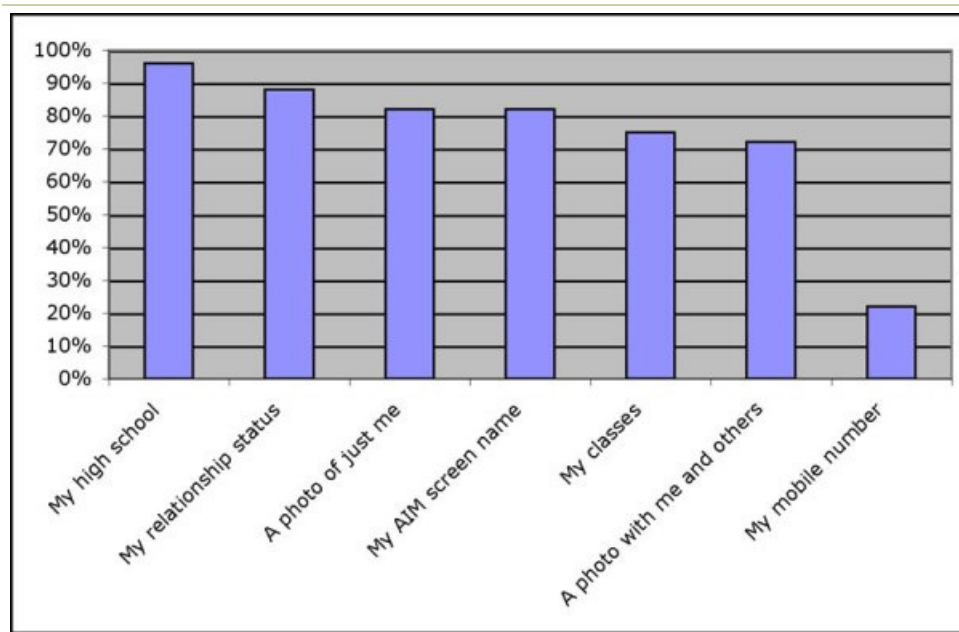
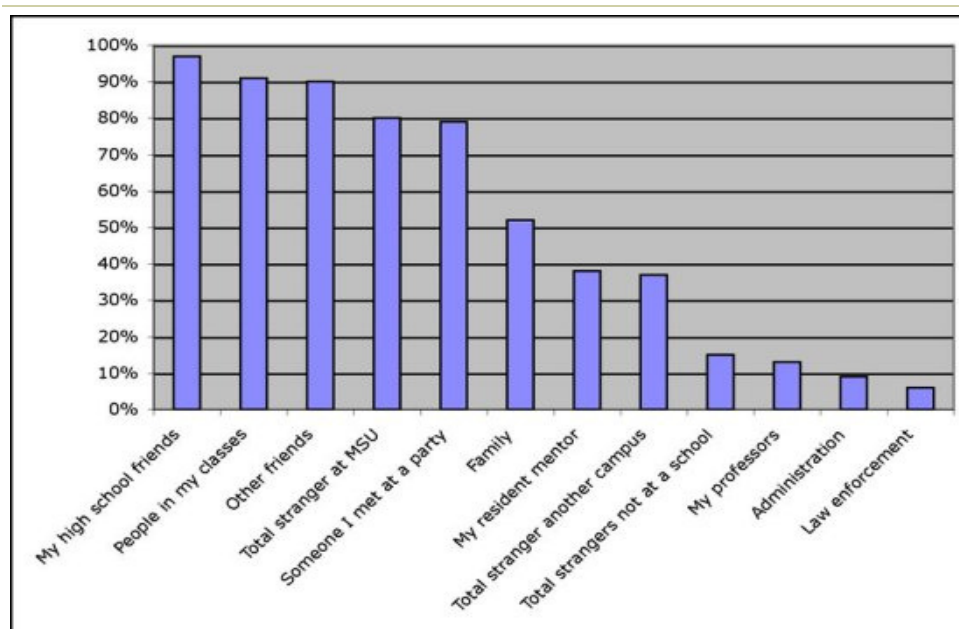Figure 1. Self-reported elements in respondents' Facebook profiles

Figure 2. Perceived audience for respondents' Facebook profiles

As Figure 2 suggests, students view the primary audience for their profile to be people with whom they share an offline connection. This is suggested as well by the responses to items about how they use Facebook. Mean scores for the offline-to-online scale were significantly higher than those for the single-item online-to-offline measure (p<.0001). This suggests that students use Facebook primarily to maintain existing offline relationships or to solidify what would otherwise be ephemeral, temporary acquaintanceships. There was a slight tendency for newer students to use Facebook to meet new people more than for juniors and seniors to do so (see Figure 3), but across all four years in school, respondents reported greater use of Facebook for connecting with existing offline contacts.
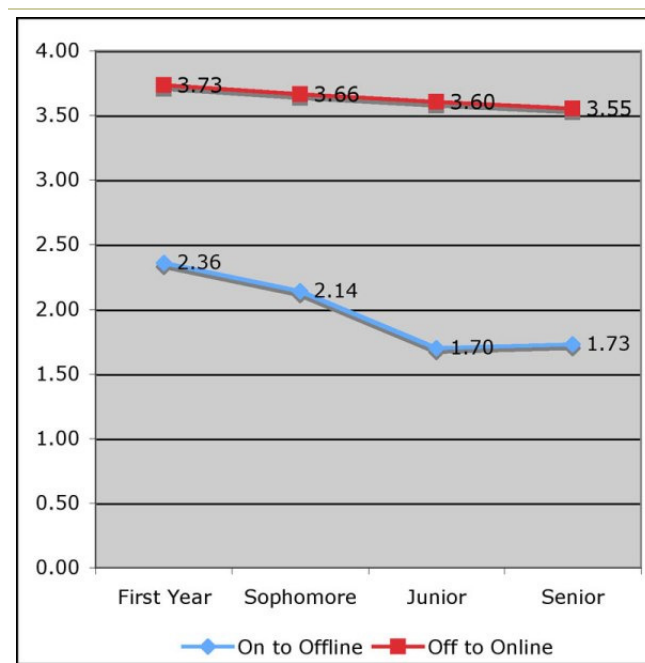
Figure 3. Offline-to-online vs. online-to-offline mean scores by year in school

In order to explore our research hypotheses regarding the relationship between Facebook use and the various forms of social capital, we conducted regression analyses. In each regression, we controlled for demographic, subjective well-being and Internet use factors, in order to see if usage of Facebook accounted for variance in social capital over and above these other independent variables.

To test Hypothesis 1, we first investigated the extent to which demographic factors, psychological well-being measures, and general Internet use predicted the amount of bridging social capital reported by students; the adjusted R^2 for this model was .38. We then entered the Facebook intensity variable, which raised the adjusted R^2 to .43. An additional pair of analyses further explored whether Facebook intensity interacted with the self-esteem and satisfaction with MSU life scales (see Table 6). The key finding is that, after first controlling for demographic factors, psychological well-being measures, and general Internet use, the extent to which students used Facebook intensively still contributed significantly (scaled beta[5]=.34, p<.0001), supporting Hypothesis 1. Interestingly, general Internet use was not a significant predictor of bridging social capital, suggesting that only certain kinds of uses of the Internet support the generation and maintenance of bridging social capital. The significance of these variables did not change when the interaction terms were added. We also explored whether gender and year in school interacted with Facebook intensity, in order to see if gender or time at MSU accounted for variation in the association between bridging social capital and Facebook use. These interactions were not significant and are not included in the table.

Overall, our independent factors accounted for nearly half of the variance in bridging social capital. The results suggest that Facebook is indeed implicated in students' efforts to develop and maintain bridging social capital at college, although we cannot assess causal direction. Few demographic factors matter, although white students are somewhat more likely to have bridging social capital than non-white students (scaled beta=.08, p<.05). Among the psychological measures, the extent of students' satisfaction with life at MSU was strongly correlated with bridging social capital (scaled beta=.66, p<.0001).

To explore Hypotheses 3a and 3b, the interaction between Facebook use and the psychological measures was examined (Figures 4 and 5). Both hypotheses, which predicted that the relationship between Facebook use and bridging social capital would vary based upon the degree of self-esteem and satisfaction with life, are supported. Students reporting low satisfaction and low self-esteem appeared to gain in bridging social capital if they used Facebook more intensely, suggesting that the affordances of the SNS might be especially helpful for these students.

Independent Variables[1]	Model 1: Control Factors, Facebook Intensity, and Facebook X Self-Esteem Interaction		Model 2: Control Factors, Facebook Intensity, and Facebook X Satisfaction with MSU Life Interaction	
	Scaled Beta[2]	p[3]	Scaled Beta	p
Intercept	3.80	****	3.85	****
Gender: male	-0.02		-0.03	
Gender: female	0.02		0.03	

Ethnicity: white	0.08	*	0.07	
Ethnicity: nonwhite	-0.08	*	-0.07	
Income	0.04		0.05	
Year in school	0.00		0.01	
State residence: in-state	-0.05		-0.07	
State residence: out-of-state	0.05		0.07	
Local residence: on campus	-0.04		-0.03	
Local residence: off campus	0.04		0.03	
Fraternity/sorority member	-0.01		-0.03	
Not a member of fraternity/sorority	0.01		0.03	
Hrs of Internet use per day	-0.03		-0.01	
Self esteem	0.20	***	0.22	****
Satisfaction with MSU	0.66	****	0.61	****
Facebook (FB) intensity	0.34	****	0.31	****
Self-esteem by FB intensity[4]	-0.35	**		
Satisfaction by FB intensity			-0.51	***

N=269 F=18.83, ****   F=19.92, ****
       Adj. R^2=.44   Adj. R^2=.46

Table 6. Regressions predicting the amount of *bridging* social capital from demographic, attitudinal, and Facebook variables

Notes: [1] Nominal factors expanded to all levels. [2] Continuous factors centered by mean, scaled by range/2. [3] $* p<.05$, $** p<.01$, $*** p<.001$, $**** p<.0001$. [4] Only one interaction term was entered at a time in each regression.
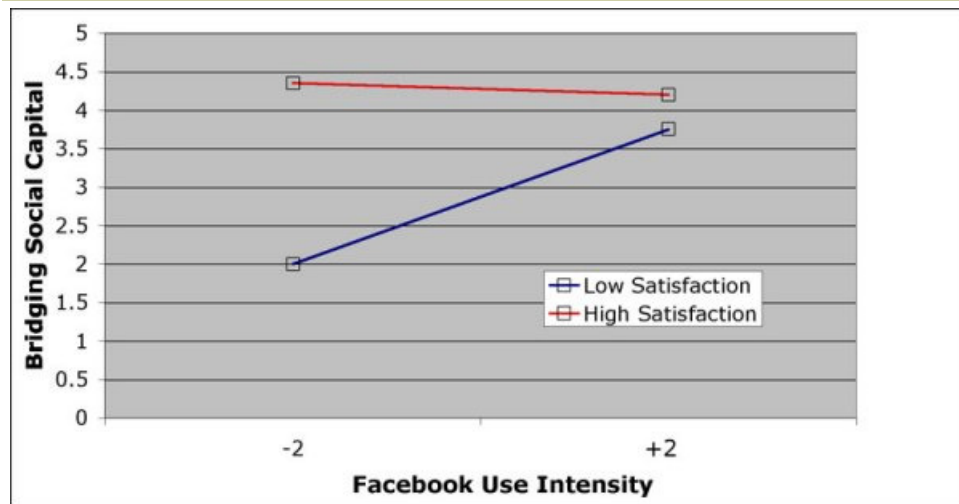

Figure 4. Interaction of Facebook use intensity and satisfaction with MSU life on bridging social capital
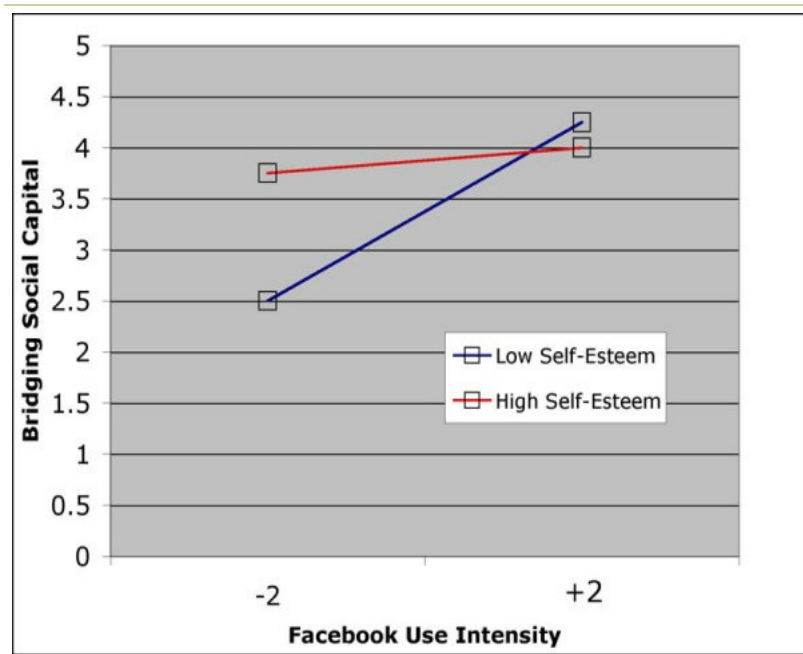
Figure 5. Interaction of Facebook intensity and self-esteem on bridging social capital

As shown in Table 7, bonding social capital was also significantly predicted by the intensity with which students used Facebook (scaled beta=.37, p<.001 in model 2). Other factors that related to bonding social capital were ethnicity (being white, scaled beta=.16, p<.01, model 2), year in school (scaled beta=.22, p<.01, model 2), living on campus (scaled beta=.13, p<.01, model 2), self-esteem (scaled beta=.23, p<.01, model 2), and satisfaction with MSU life (scaled beta =.40, p<.001, model 2). General Internet use was not a significant predictor of bonding social capital, and the interactions between Facebook use and the two psychological measures were not significant. As in the bridging social capital analysis, gender and year in school did not interact significantly with Facebook use in predicting bonding social capital. The adjusted R2 for the control factors alone was .19; adding Facebook Intensity raised this statistic to .22. Again, the same variables were significant when the interactions were added. Overall, the included variables accounted for almost one quarter of the variance in students' reported bonding social capital.

Independent Variables[1]	Model 1: Control Factors, Facebook Intensity, and Facebook X Self-Esteem Interaction		Model 2: Control Factors, Facebook Intensity, and Facebook X Satisfaction with MSU Life Interaction	
	Scaled Beta[2]	p[3]	Scaled Beta	p
Intercept	3.73	****	3.76	****
Gender: male	0.07		0.06	
Gender: female	-0.07		-0.06	
Ethnicity: white	0.17	**	0.16	**
Ethnicity: nonwhite	-0.17	**	-0.16	**
Income	0.07		0.07	
Year in school	0.23	***	0.23	***
State residence: in-state	-0.09		-0.10	
State residence: out-of-state	0.09		0.10	
Local residence: on campus	0.13	**	0.14	**
Local residence: off campus	-0.13	**	-0.14	**
Fraternity/sorority member	-0.07		-0.08	
Not a member of fraternity/sorority	0.07		0.08	
Hrs of Internet use per day	-0.01		0.01	
Self esteem	0.22	**	0.24	**
Satisfaction with MSU	0.40	***	0.37	***

	Scaled Beta	p	Scaled Beta	p
Facebook (FB) intensity	0.37	****	0.34	***
Self-esteem by FB intensity[4]	-0.32			
Satisfaction by FB intensity			-0.26	
N=269	F=7.60, **** Adj. R^2=.23		F=7.48, **** Adj. R^2=.22	

Table 7. Regressions predicting the amount of *bonding* social capital from demographic, attitudinal, and Facebook variables

Notes: [1] Nominal factors expanded to all levels. [2] Continuous factors centered by mean, scaled by range/2. [3] * p<.05, ** p<.01, *** p<.001, **** p<.0001. [4] Only one interaction term was entered at a time in each regression.

Finally, entering only our control factors accounted for 13% of the variance in maintained social capital (Table 8). Adding Facebook intensity raised the R^2 to .17 and revealed the same strong connection to Facebook intensity (scaled beta=.36, p<.001), even after controlling for the number of years at college (and thus, away from high school) and general Internet use. Interestingly, general Internet use was also a significant predictor of maintained social capital (scaled beta=.26, p<.05), suggesting that other Internet applications are useful in this case. Ethnicity (being white, scaled beta=.23, p<.001) and self-esteem (scaled beta=.30, p<.001) were the other significant variables in this regression. None of the interactions were significant. Together, the independent variables accounted for 16% to 17% of the variance in the maintained social capital measure.

	Model 1: Control Factors, Facebook Intensity, and Facebook X Self-Esteem Interaction		Model 2: Control Factors, Facebook Intensity, and Facebook X Satisfaction with MSU Life Interaction	
Independent Variables[1]	**Scaled Beta[2]**	**p[3]**	**Scaled Beta**	**p**
Intercept	3.57	****	3.60	****
Gender: male	-0.02		-0.02	
Gender: female	0.02		0.02	
Ethnicity: white	0.23	***	0.23	***
Ethnicity: nonwhite	-0.23	***	-0.23	***
Income	0.08		0.08	
Year in school	-0.09		-0.08	
State residence: in-state	0.06		0.05	
State residence: out-of-state	-0.06		-0.05	
Local residence: on campus	-0.06		-0.05	
Local residence: off campus	0.06		0.05	
Fraternity/sorority member	-0.02		-0.03	
Not a member of fraternity/sorority	0.02		0.03	
Hrs of Internet use per day	0.26	*	0.27	*
Self esteem	0.30	***	0.31	***
Satisfaction with MSU	-0.02		-0.04	
Facebook (FB) intensity	0.37	****	0.36	***
Self-esteem by FB intensity[4]	-0.11			
Satisfaction by FB intensity			-0.29	
N=269	F=5.40, **** Adj. R^2=.16		F=5.57, **** Adj. R^2=.17	

Table 8. Regressions predicting the amount of *maintained* social capital from demographic, attitudinal, and Facebook variables

Notes: [1] Nominal factors expanded to all levels. [2] Continuous factors centered by mean, scaled by range/2. [3] * p<.05, ** p<.01, *** p<.001, **** p<.0001. [4] Only one interaction term was entered at a time in each regression.

Discussion

Returning to our original research question, we can definitively state that there is a positive relationship between certain kinds of Facebook use and the maintenance and creation of social capital. Although we cannot say which precedes the other, Facebook appears to play an important role in the process by which students form and maintain social capital, with usage associated with all three kinds of social capital included in our instrument.

Although representation of non-users is low in our sample, when we compare members vs. nonmembers, we see no real difference in demographics, with the exception of class year and age (which is strongly correlated with class year). This is most likely due to the fact that Facebook is a relatively recent phenomenon, and we would expect senior students to be less likely to join. The high penetration and lack of any systematic difference between members and non-members suggests that Facebook has broad appeal, does not exclude particular social groups, and has not had a noticeable effect on participants' grades.

Our participants overwhelmingly used Facebook to keep in touch with old friends and to maintain or intensify relationships characterized by some form of offline connection such as dormitory proximity or a shared class. For many, Facebook provided a way to keep in touch with high school friends and acquaintances. This was demonstrated through the fact that the most commonly included information on users' profiles was likely to be relevant for existing acquaintances trying to find them (e.g., their high school) and that nearly all users felt that their high school friends had viewed their profile, and through respondents' self-reported types of use (connecting with offline contacts as opposed to meeting new people). This offline to online movement differs from the patterns observed by early researchers examining computer-mediated communication and virtual communities. Due to the structure of the site, which blocks entry to those without a school email address and then places individuals into communities based on that email address, Facebook serves a geographically-bound user base.[6]

Our first dimension of social capital—bridging—assessed the extent to which participants were integrated into the MSU community, their willingness to support the community, and the extent to which these experiences broadened their social horizons or worldview. Our findings suggest that certain kinds of Facebook use (articulated by our Facebook intensity items) can help students accumulate and maintain bridging social capital. This form of social capital—which is closely linked to the notion of "weak ties"—seems well-suited to social software applications, as suggested by Donath and boyd (2004), because it enables users to maintain such ties cheaply and easily. Although more research is needed to understand the nature of this trend, we suspect that Facebook serves to lower the barriers to participation so that students who might otherwise shy away from initiating communication with or responding to others are encouraged to do so through Facebook's affordances.

Participants' reports about who is viewing their profile provide insight into this dynamic. As depicted in Figure 2, students report that the primary audiences for their profiles are high school friends and people they know from an MSU context. This implies that highly engaged users are using Facebook to crystallize relationships that might otherwise remain ephemeral. Haythornthwaite (2005) discusses the implications of media that "create latent tie connectivity among group members that provides the technical means for activating weak ties" (p. 125). Latent ties are those social network ties that are "technically possible but not activated socially" (p. 137). Facebook might make it easier to convert latent ties into weak ties, in that the site provides personal information about others, makes visible one's connections to a wide range of individuals, and enables students to identify those who might be useful in some capacity (such as the math major in a required calculus class), thus providing the motivation to activate a latent tie. These weak ties may provide additional information and opportunities, which are expressed as dimensions of bridging social capital that speak to interaction with a wide range of people and the more tolerant perspective this might encourage. Facebook seems well-suited to facilitate these experiences, in that detailed profiles highlight both commonalities and differences among participants.

We also found an interaction between bridging social capital and subjective well-being measures. For less intense Facebook users, students who reported low satisfaction with MSU life also reported having much lower bridging social capital than those who used Facebook more intensely. The same was true for self-esteem. Conversely, there was little difference in bridging social capital among those who reported high satisfaction with life at MSU and high self-esteem relative to Facebook use intensity. One explanation consistent with these interaction effects is that Facebook use may be helping to overcome barriers faced by students who have low satisfaction and low self-esteem. Because bridging social capital provides benefits such as increased information and opportunities, we suspect that participants who use Facebook in this way are able to get more out of their college experience. The suggestion that Facebook use supports a "poor get

richer" hypothesis, as opposed to the "rich get richer" findings reported in other contexts (Kraut, Kiesler, Boneva, Cummings, Helgeson, & Crawford, 2002), may be of special interest to Internet researchers.

Bonding social capital was also predicted by high self-esteem, satisfaction with university life, and intense Facebook use, although overall, the regression model predicting bonding social capital accounted for less of the variation for this dependent variable than for bridging social capital. However, Facebook appears to be much less useful for maintaining or creating bonding social capital, as indicated by the fact that the bonding model only accounted for 22% of the variance (versus 46% in the bridging social capital models). We might expect Facebook usage to have less of an impact on bonding than bridging social capital given the affordances of this service. It can lower barriers to participation and therefore may encourage the formation of weak ties but not necessarily create the close kinds of relationships that are associated with bonding social capital. Yet the strong coefficient for Facebook intensity suggests that Facebook use is important for bonding social capital as well. One explanation is that it may help individuals to *maintain* pre-existing close relationships, just as it can be used as a low-maintenance way to keep tabs on distant acquaintances. For instance, in our pilot interviews, students discussed the "birthday" feature of Facebook, which prompted them to send birthday greetings to friends with minimal effort.

Finally, Facebook intensity predicted increased levels of maintained social capital, which assessed the extent to which participants could rely on high school acquaintances to do small favors. For college students, many of whom have moved away for the first time, the ability to stay in touch with these high school acquaintances may illustrate most clearly the "strength of weak ties" outlined by Granovetter (1973, 1982). These potentially useful connections may be valuable sources of new information and resources. Additionally, the ability to stay in touch with these networks may offset feelings of "friendsickness," the distress caused by the loss of old friends.

Limitations to this study include the fact that we examined only one community. Because the college years are a unique developmental period in the life cycle and because the MSU Facebook community is closely coupled with the geographically bounded MSU community, we are not able to generalize these findings to other kinds of communities or social network tools. It may be that the positive outcomes linked to Facebook use discussed here are limited to this special case in which the offline community is bounded spatially and to the unique nature of the undergraduate experience. Future research could explore Facebook use in other contexts, such as organizations and high schools. Because we used a one-time survey, we cannot establish causality. Additionally, the extremely low incidence of non-members, non-White, or international students in our sample hampered our ability to assess the effects of Facebook membership on these groups. Finally, respondents may have misreported behavioral or demographic information, as we used self-reported rather than direct measures of Facebook use and other variables.

To address these concerns, future research should approach Facebook use and the generation of social capital via multiple methodologies. Profile capture and analysis would allow researchers to marry survey responses with direct behavioral measures. Additionally, experimental interventions would support causal claims; these interventions could be in the form of a survey, with pre- and post-test data collected from the site itself. Collecting longitudinal data over a series of years, tracking incoming first-year students and following them after they graduate, is also a necessary next step.

Conclusions

Our empirical results contrast with the anecdotal evidence dominating the popular press. Although there are clearly some image management problems experienced by students as reported in the press, and the potential does exist for privacy abuses, our findings demonstrate a robust connection between Facebook usage and indicators of social capital, especially of the bridging type. Internet use alone did not predict social capital accumulation, but intensive use of Facebook did.

The strong linkage between Facebook use and high school connections suggests how SNSs help maintain relations as people move from one offline community to another. It may facilitate the same when students graduate from college, with alumni keeping their school email address and using Facebook to stay in touch with the college community. Such connections could have strong payoffs in terms of jobs, internships, and other opportunities. Colleges may want to explore ways to encourage this sort of usage.

Online social network sites may play a role different from that described in early literature on virtual communities. Online interactions do not necessarily remove people from their offline world but may indeed be used to support relationships and keep people in contact, even when life changes move them away from each other. In addition to helping student populations, this use of technology could support a variety of populations, including professional researchers, neighborhood and community members, employees of companies, or others who benefit from maintained ties.

Acknowledgments

Notes

1. "Netville" residents with broadband Internet connections and access to a local online community discussion board were more likely to be involved with their neighbors than were their non-wired peers: They recognized three times as many and talked to twice as many (Hampton & Wellman, 2003).
2. Differences were as follows: 54% of the MSU student population is female vs. 66% of our respondents; 58% of MSU students live off-campus vs. 45% of our respondents; 11% of MSU students are out of state vs. 9% of our respondents.
3. We interviewed one graduate and six undergraduate students about their Facebook use; the data were used to inform survey construction and study design.
4. We asked Facebook users whether or not they had set the privacy settings on their accounts to control who viewed their profiles. More than two thirds (70%) either did not know (suggesting that they left the default setting of all members of the MSU network) or said that their profile was visible by the entire MSU network. Only 13% limited access only to their friends, while the rest blocked only certain individuals. Figure 2 does not take respondents' privacy settings into account.
5. A scaled beta is similar to a standardized regression coefficient in that the coefficients are adjusted so that they correspond to factors that are scaled to have a mean of zero and range of two. This makes it easier to compare effect sizes when factors have different scales.
6. In May of 2006, Facebook began establishing company sites and allowed members to choose their networks. Nonetheless, college Facebook communities remain defined by those who have a school email account.

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