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The Influence of New Communication Technologies on Undergraduate Preferences for Social Capital Formation, Maintenance, and Expenditure

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This article reports on a survey measuring how university students communicate with various audiences and found that the use of technology centers on social (rather than work or task) functions. Results suggest that social capital involves a choice among various communication technologies. The preference for and attachment to cell phones, instant messaging, and e-mail and the willingness to use technology as a part of an approach to engaging in social capital formation, maintenance, and use marks college age individuals as unique. Results also suggest a collision of sorts in which individuals with very diverse approaches to social capital must find ways to come together, to adapt, and to cooperate to produce the very outcomes that many social capital theorists have lamented the loss of.

The importance of new communication technologies is widely recognized by public relations professionals. However, there appears to be little consensus or even discussion concerning the underlying processes that might account for success or failure in the use of these technologies in public relations. Two emergent ideas from the scholarly literature of public relations seem useful in addressing this issue. The first of these ideas is the view of public relations as public relationships. In the present study this idea is reflected in the Social Capital Theory of Public Relations (Hazleton and Kennan, 2006; Hazleton and Kennan, 2000) which links social capital to other forms of capital returns to organizations. The second idea has been labeled the "Co-creationist Perspective of Public relations (Botan and Taylor, 2004; Botan and Hazleton, 2006). The co-creationist perspective views publics as active rather than passive participants in public relationships. So in the present study we examine how our survey respondents use new technologies from both a social capital and relationship perspective. The result is a better understanding of an important emergent public's use of new technologies in communication.

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Opinion differs as to whether the Internet increases (Shah, Kwak, & Holbert, 2001; Bimber, 1998; Jones, 1995; Katz & Aspden, 1997; Rheingold, 1993) or decreases (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998) social capital. One particular disagreement seems to be whether technologies such as web pages, e-mail, instant messaging, online gaming, Thefacebook, Myspace, and cell phones increase isolation, thus reducing social capital or whether new communication technologies allow relationships to be enhanced, unencumbered by space and time, thus increasing social capital. The alternative suggested by the research reported here is that the increasing importance of communication technology indexes what may be a fundamental shift in the basic nature of social capital and this shift portends a future in which communication management is more challenging because of diverse approaches to its formation, maintenance, and utilization.

One limitation in the social capital literature of Internet use is that it fails to acknowledge the wide range of individual modalities available for interaction and how those modalities are selected and used to build, maintain, and expend social capital. Rather, this literature often primarily considers the amount of time one spends involved in single Internet activities, seeing individual options as somehow similar and ignoring the choices among channels that individuals make regarding various kinds of social capital activities. The research reported here provides a descriptive analysis of what interaction preferences are most prominent among college students with regard to social capital creation, maintenance, and use. This paper offers the following features: it views technologies collectively and examines how they are chosen and used to accomplish social capital activities, it recognizes an alternative to the creative or destructive perspectives suggesting that social capital is changing, and it suggests that basic alterations in social capital formation, conservation, and use create the potential for conflict in contemporary institutions and organizations.

Literature Review

Social Capital Theory

The development of social capital as a concept begins with the work of Bourdieu (1986). It has been extended and popularized by Coleman (1988), Fukuyama (1995), Putnam (1995a, 1995b), Lin (2001), and Burt (1992). What follows acknowledges this foundation and creates a framework for the research reported below.

Hazleton and Kennan (2006, 2000) build on those traditions to define social capital as the "ability that organizations have of creating, maintaining, and using relationships to achieve desirable organizational goals" (p. 322). Individuals and groups acquire, retain, and expend social capital through communication; the basis of relationships which in turn becomes the foundation of social capital. Hazleton and Kennan (2000) emphasize the multi-dimensional nature of social capital drawing on the work of Nahapiet and Ghoshal (1998) by taking the structural and relational dimensions and omitting their cognitive dimension in favor of a communication dimension.

The structural dimension refers to the web of network connections that create the potential for social capital. Individuals are constrained by networks but are also capable of expanding, organizing, and reorienting their networks. Burt (1992) proposes three components of networks: access, referral, and timing. Hazleton and Kennan (2000) draw from Coleman's (1988) work to add a fourth component, appropriability. Access refers to the ability to send and receive messages as well as the ability to gain entry to networks. Referral indicates the degree to which individuals can access networks through their associations with others. Timing encompasses the availability of messages in a time frame useful to individuals, groups, and organizations for goal attainment. Appropriability is the degree to which a network configured for one purpose can be redirected to a different use.

The relational dimension of social capital focuses on the nature and character of connections among individuals (Hazleton & Kennan, 2000). Hazleton and Kennan identify three relational components: trust, tie strength (Granovetter, 1973), and identification. Trust refers to anticipated cooperation (Burt & Knez, 1995), while identification refers to the degree to which individuals see themselves as being connected to others in a network (Portes, 1998). Tie strength refers to frequency and intimacy of the connection among actors. Seibert, Kraimer, and Liden (2001) found that relational connections can increase access to information and resources as well as career sponsorship, which can in turn increase both career success and satisfaction.

The communication dimension centralizes the essential mechanism through which social capital is created, maintained, and expended. Essential to the communication dimension is the role of messaging in forming and maintaining relationships (Fussell, Harrison-Rexrode, Kennan, & Hazleton, 2006). Communication becomes essential to accessing and expending social capital through basic communication activities, such as exchanging information, identifying problems and solutions, regulating behaviors, and managing conflicts (Hazleton & Kennan, 2000).

Technology and Social Capital

Preferences for new technologies and how they are utilized influences the structural, relational, and communication dimensions of social capital. While Putnam's concerns and that of other researchers are reasonable there is every reason to believe that the basic character of social capital may be changing in ways common and comfortable for new generations of actors but potentially awkward, frustrating, and alien for others. What emerges may look very different from traditional conceptualizations of social capital, but it may be social capital all the same. This section discusses various technologies and the potential impact each one has on social capital.

Resnick (2002) uses the term sociotechnical capital to refer to the interaction of socialization with advancing communication technology. Hampton and Wellman (1999) opine that social capital is the "sociable and supportive aspect of interaction that defines community," and not the physical area where an interaction could occur face-

to-face (p. 492). Former conceptions of social capital may have become outdated in the presence of communication technologies. Engaging in technology-based communication can be less time-consuming as individuals communicate for shorter periods of time or multi task while interacting. It is also possible that communication technology intertwines in new and unique ways with face-to-face interaction. It is important to note that individuals who interact in online communities often know and interact with one another off line as well (Kavanaugh, Carroll, Rosson, Zin, & Reese, 2005). The Internet, for example, can be seen as a technology that produces social capital because members of social networks can take advantage of the information distributed in online networks to become more effective and linked actors (Wellman, Carrington, & Hall, 1988; Wellman & Gulia, 1999). In the work environment Wellman, Quan Haase, Witte and Hampton (2001) argue that the Internet both supplements and increases an individual's organizational involvement.

Borgida, Sullivan, Oxendine, Jackson, Riedel, and Gangl (2002) found that levels of social capital may influence the impact of the Internet on social relationships. The strength of social capital and individual relationships before technology is considered has an effect on how easily the Internet will be integrated into the social network and used to either enhance or threaten current relationships.

Positive Effects of Technology on Social Capital

Shah, Schmierbach, Hawkins, Espino, and Donavan (2002) and Bargh and McKenna (2004) argue against the belief that the Internet takes time and focus away from social life. Shah et al. claim that Internet use increases communication and integration rather than decreasing it. A positive relationship between Internet use and engagement supports the Internet as a socializing mechanism as individuals interact while using the Internet's vast informational resources to seek and plan ways to become more involved in off-line communities. In addition, Onyx and Bullen (2000), in questioning the reliance on voluntarily group membership as a measure of social capital, asserted that social capital may be created whenever people voluntarily come together for mutual benefit and trust building. New technologies can, therefore, be a mechanism for bringing people together for creation and maintenance of social capital. Wellman et al. (2001) found that Internet use adds network capital, increasing social network strength by extending existing levels of face-to-face and telephone contact. Using the Internet gives individuals another format for connection, thereby increasing the ease and frequency with which that connection is made.

Yli-Renko, Autio, and Tontti (2000) found that the interaction between members of an organization, aided by technology, can lead to an increase in general knowledge within the organization, thus, increasing the knowledge-intensity. This knowledge-intensity can then be turned into internal and external social capital, creating the networks of information that Yli-Renko et al. claim as necessary for organizational growth and increased success.

In studying college students and their use of technology Aiken, Vanjani, Ray, and

Martin (2003) found that the typical university student is one of the most technologically savvy individuals in society. Approximately three-fourths of students surveyed go online for fun and entertainment. Over half of those students go online for e-mail and other socially connective functions. Students felt satisfaction with the Internet as a form of communication as it provides access to a network that may be utilized at any time.

Shah, Kwak, and Holbert (2001) stated that the Internet can exert positive influence on social capital, specifically with regard to users motivated by information acquisition. Internet use for information searching was found to have a positive impact on an individual's mobility and civic participation as individuals receive empowering information. Shah, et al. also highlighted the coordination possibilities of e-mail to impact individual levels of social capital. Conversely, they also found individuals who use the Internet primarily for social recreation, such as games and anonymous chat rooms, do not gain social capital benefits.

Negative Effects of Technology on Social Capital

Aiken et al. (2003) report that individuals who spend more time online are more likely to have higher rates of emotional loneliness and lower rates of social loneliness. Caplan (2003) concurs that not all Internet use is beneficial. Individuals with decreased psychosocial well-being (those who suffer from depression or severe loneliness) were found to spend increased amounts of time using the Internet to form social connections. According to Caplan, using the Internet is a "safer and less threatening alternative" to face-to-face communication because these individuals view themselves as ". . . more efficacious, more confident, and more comfortable . . ." online (p. 628-629). The decreased necessity for interpersonal competence on the Internet becomes tempting to the socially awkward individual, even though the relationships formed online tend to be more superficial and have less depth than a relationship formed through face-to-face communication. Wallace (1999) adds that online communication is "hard for any humdrum reality to compete with, especially for people whose lives are already troubled" (p. 182). This need to hide behind technology to form relationships is viewed as a false increase in social capital; a tie is indeed formed, but because it is never fully utilized or maintained it does not benefit either individual engaged in the experience.

E-mail

E-mail is a technological innovation that allows for frequent and time efficient communication when compared to face-to-face interaction or letter-writing (Trice, 2002). E-mail facilitates contact in an expanded network. Boase, Horrigan, Wellman, and Rainie (2006) found that as one's network increases use of e-mail for contact with the network remains constant. E-mail may be seen as especially acceptable for those with which one does not have a strong tie because it fulfills a need for social capital maintenance without being intrusive or making significant time investments. E-mail is among the more frequent ways of communicating used in a collegiate setting. Through e-mail, students remain in contact with their families, friends, and professors. In this

way e-mail serves as a supplement to face-to-face and phone contact (Boase, et al., 2006; Wellman, Quan-Haase, Witte, & Hampton, 2001). Trice found that college freshman e-mailed their parents an average of six times a week and that e-mail frequency generally increased during times of stress, but not necessarily for the purpose of communicating the stress or gaining advice.

Cummings, Butler, and Kraut's (2002) study of college student use of e-mail revealed that e-mail was satisfying for completing school-related work and information exchange, but inferior to phone or face-to-face communication for maintaining relationships. Cummings, et al. also reviewed data gathered as part of the Pittsburgh HomeNet project, an Internet trial research project that monitored initial Internet access of a household to view differences in Internet and non-Internet dependent relationships. Individuals reported communicating less frequently and feeling more distant from individuals to whom they sent the most e-mail as compared to the person with whom they had the most non-Internet contact. Accordingly, predominantly online relationships can be seen as having fewer socialization benefits to an individual than relationships that occur predominantly off line.

However, the ability to connect to a more diverse group of people increases the benefits of using email. Results from the Pittsburgh HomeNet project also indicate that email helped respondents deepen their existing ties to their hometown and establish ties with people of a different race, ethnic, or economic background (Scott & Johnson, 2005). In addition, Boase et al. (2006) found that email increased individual's social networks as individuals had more strong or core ties and more acquaintances, as well as more relationships that would fall in between strong friendship and mere acquaintance. Their work also suggests that non-Internet users have fewer weak ties than Internet users.

Cell Phones

In addition to developing and maintaining social capital through Internet use and e-mail, the speed at which cell phones have been adopted as an essential technology for interpersonal connection is one of the fastest in technological history. Even though cell phones originated as tools for business use, they have evolved as important personal communication devices for social interaction. College students initially adopted cell phones for safety reasons and parental pressure. However, Aoki and Downes (2003) reported that as of October 2001, over half of cell phone users purchased a cell phone primarily for social purposes. Cell phones can also be used to provide instant Internet access, text messaging, and voice mail. As cell phone usage has increased, college students have become more dependent on their cell phones for social purposes such as creating meeting times or places for social interactions and emotional and social communication (Aoki & Downes). Wei and Leung (1999) found that cell phone use for calling family, friends, and co-workers, was much more common than business use. Aoki and Downes found that college-aged individuals favored cell phones over land line phones because they allowed for increased access to close circles of friends and family. Boase et al. (2006) found cell phones to be a

preferred method, along with face-to-face and landline telephones, for connecting with those friends and family where there is a strong relationship. Flanagin (2005) compared cell phones to instant messaging with regard to need satisfaction. Respondents preferred cell phones for their ease of communication that facilitated task accomplishment and socializing.

Igarashi, Takai, and Yoshida (2005) note that the intimacy and connection between individuals who communicate both face-to-face and through cell phone messages was higher than among those individuals who only communicated face-to-face. Social networks formed through cell phones might be slower to form than those that include face-to-face communication, but will eventually reach comparative levels of intimacy and connectedness. Smith and Williams (2004) found that individuals who sent and received messages on their cell phones reported feeling more included and involved with others around them. Those who reported not using cell phones reported an increase in feelings of social isolation. These results suggest that technology can increase connections and social capital.

Instant Messaging

College students use instant messaging applications as substitutes as well as supplements to face-to-face interaction. Hu, Wood, Smith, and Westbrook (2004) found that instant messaging served as a supplement to face-to-face communication because it led to a desire to communicate face-to-face. Instant messaging allows students to create a screen name and a buddy list, adding screen names of friends for interactive chat. Ruppel and Fagan (2002) suggest that college students choose to use instant messaging rather than calling their peers on the telephone or visiting them in person. Lee and Perry (2004) found that instant messaging has emerged as a primary medium for communication on a technologically advanced campus where students indicated using instant messaging more often than the phone, e-mail, and face-to-face communication. According to Grinter and Palen (2002) instant messaging fulfills many of the functions that more traditional methods could fulfill, such as updating others about their day, planning spur of the moment events, and discussing schoolwork. Respondents indicated that they used instant messaging to communicate with those whom one had a face-to-face relationship, either currently or previously, and was chosen as a method of communication for its cost effectiveness.

Technology can be used to increase social capital with those whom it would be physically impossible to interact face-to-face. Flanagin (2005) found that individuals viewed instant messaging as a viable medium for establishing new relationships, especially among those geographically distant. Read (2004) and Wellman, Quan-Haase, Witte, & Hampton (2001) report that most people have a social network that extends beyond their local community and that technology enables them to maintain those connections without excessive cost or personal strain.

Donath (2002) stated that actors can manage interactions using the capabilities of instant messaging software. Since each conversation appears in its own window on

a computer screen individual communicators can place specific emphasis on particular conversations based on its physical screen location, making it more meaningful and visually identified as a unique opportunity for interaction.

Quan-Hasse, Cothrel, and Wellman (2005) found that instant messaging can lead to increased work productivity by offering people with common interests or work problems the opportunity to connect without having to worry about space or time. Social networks formed via instant messaging increases information flow and smooths social interaction which increases performance. Quan-Hesse et al. also found that collaboration increases through the use of instant messaging to check facts and ask questions. Forming community strictly through instant messaging can be limiting as only those individuals who are on buddy lists become part of the social network connection while others are excluded.

Instant messaging, e-mail, and now cell phones are not mutually exclusive. Grinter and Palen (2002) found that instant messaging did not replace but rather supplemented e-mail. E-mail was equally as prevalent as instant messaging but was generally viewed as a more formal method of communication, requiring more careful and thoughtful composition for communicating important messages such as interacting with instructors.

TheFaceBook and Myspace

As the Internet has developed, new resources for online communication and information exchange have also developed. Read (2004) concluded that Thefacebook.com serves as a social network of students at universities across the country. Student perceptions indicate that it provides a way to meet people, start friendships or romantic relationships, or maintain previously existing friendships and romantic relationships. Hanson (2005) reports that more than 8.5 million people use Thefacebook.com each month, increasing site visits to over 200 million per day. Thefacebook.com allows students to view peers at a large number of universities and send messages to alumni through e-mail or Thefacebook.com's own message system. Students who discover one another on Thefacebook.com find that it can be an easy way to begin communication by discovering common interests and backgrounds. It also provides another cost-effective avenue for staying in touch with those who are not available for face-to-face communication. New technologies such as Thefacebook.com open up a new avenue of information exchange and interaction and thus a new realm of social capital formation.

Synthesis

Two key issues emerge from the literature. First, new communication technologies have led to basic changes in the way young adults build, maintain, and expend social capital. According to Shah, Cho, Eveland, and Kwak (2005), young people’s preferences for technology are changing the face of civic participation. While individuals may be less engaged in their offline community, they are actually still engaged as they utilize the Internet for exchange of information, ideas, and opinions.

Second, the literature tends to focus on one technology at a time while overlooking the normal interactive day of individuals and the choices they make when they create, maintain, or utilize social capital. For example, in the normal day what is the relationship between communication technologies and face-to-face interaction with regard to various communication activities? Imagine that an individual needs to manage the conflict that has arisen with a friend. What choices are made with regard to communication? Will the individual pick up their cell phone, wait until they get home to email, seek that person out for a face-to-face encounter, seek real time interaction via instant messaging or use some combination of channels. The fact is that people have expectations about how to create, maintain, and expend social capital in context based on their prior experience and personal evaluations of efficacy. Very little research has considered those choices and how they stand in relation to each other given particular activities.

As students take these expectations and preferences for social capital creation, maintenance, and utilization into the workplace they will impact existing networks and the formation of social capital. In fact, one might profitably avoid the traditional yawn associated with research on student populations by considering them as an "Emerging Public." This change in terminology recognizes that young individuals are entering the workplace with social capital expectations grounded in a four year immersion in technologically based interaction. This emerging public then takes those experiences into organizations, public, and private life creating change in preferences for interaction and a collision with those whose preferences are rooted in a past where technology played a much smaller role. Understanding the preferences for social capital formation, maintenance, and expenditure is essential as this previews the growth of patterns of engagement in contemporary organizations.

The preceding discussion leads to the following research questions:

RQ1: What are the communication use patterns among college aged individuals when technology is considered?

RQ 2: Which communication channels are preferred for various communication activities?

Method

Participants/Procedures

A cross-sectional convenience sample was obtained at a mid-sized comprehensive university in the Mid-Atlantic region and included 186 students surveyed with 185 usable surveys obtained. The sample included 107 females and 76 males, with two participants not reporting gender. Surveys were administered in both communication courses and residence halls. Participants were not offered credit for participation and, consistent with IRB guidelines, students were provided with consent and debriefing forms. Participants ranged in age from 18 to 45 with a mean age of

20.09. Students from each classification were represented, 29.7% were freshmen, 19% were sophomores, 32.3% were juniors, 11.8% were seniors, and 2.1% were fifth year students.

Instrument

A 93 item questionnaire was administered to participants. The survey included four demographic questions. Eighty-nine questions focused on technology use and social capital measures. In the first section of the questionnaire, participants were asked to identify the channels of communication they used and the length of time they used each one. In the second section, participants responded to questions about their instant messaging use and provided responses on five-point Likert-type scale to statements about instant messaging use. A similar set of questions was used with regard to cell phones, face-to-face communication, and e-mail.

Two pilot surveys were conducted with students at a different Mid-Atlantic university. Results from the two pilot studies indicated the need for minor changes.

Results

In response to RQ1, the following findings emerged:

Respondents indicate using face-to-face interaction, instant messaging, cell phones, and e-mail on a daily basis while blogs, personal data assistants (PDA), on-line discussions, and letter writing are the least used. Although participants rely on face-to-face interaction most frequently to communicate with the most people (M = 39.34), they also communicate daily using instant messaging (M = 14.51), cell phones (M = 13.05), and e-mail (M = 11.53). While not as frequently utilized as instant messaging, cell phones, e-mail, and face-to-face discussions respondents also indicated that land line telephones and text messaging also play their part (M = 2.94; M = 2.72). Online discussions, PDA's, blogs, letter writing, and Thefacebook.com were rarely used (M = . 19; M = .07; M = .16; M = .47; M = 1.49). Thefacebook.com may have been used less due to its recent introduction at the university about the time when data was gathered. The use of Thefacebook and MySpace has subsequently increased through their rapid adoption in this population.

Respondents indicate large numbers of contacts saved on their instant messaging buddy lists (M = 114.69) and their cell phone contact lists (M = 78.68). A portion of these large numbers of contacts represent individuals whom respondents reported not knowing: M=29.94 (instant messaging buddy list), M=19.24 (cell phone contact list), and M=5.45 (e-mail addresses). Conversely, individuals reported M=28.81 people per instant messaging list that they communicate with face-to-face on a regular basis (approximately one fourth of the total number of people on an average instant messaging list). When the same question was posed regarding cell phone use, approximately one third of the people regularly called on a cell phone contact list were also face-to-face interaction partners. Survey participants also reported face-to-face interaction with approximately one third of the individuals they e-mail on a regular

basis. Finally, respondents indicated interacting with an average of 22.83 people through multiple channels (a combination of the channels studied in this research). In response to RQ2, the following findings emerged:

Analysis of variance was calculated to determine significant differences in preferences for four communication channels (instant messaging, face-to-face interaction, cell phone, and email) against ten communication activities. Within subject effects for all ten analyses were statistically significant. Results are as follows: enhancing relationships ($F=102.68$, $df=3$, $p<.000$, Partial $\eta^2=.380$); communicating with professors ($F=426.794$, $df=3$, $p<.000$, Partial $\eta^2=.724$); getting information about classes ($F=28.564$, $df=3$, $p<.000$, Partial $\eta^2=.148$); talking through problems at school ($F=55.929$, $df=3$, $p<.000$, Partial $\eta^2=.259$); talking about personal problems ($F=90.430$, $df=3$, $p<.000$, Partial $\eta^2=.355$); talking about family problems ($F=70.985$, $df=3$, $p<.000$, Partial $\eta^2=.312$); getting truthful information from friends ($F=16.202$, $df=3$, $p<.000$, Partial $\eta^2=.109$); getting to know people ($F=189.773$, $df=3$, $p<.000$, Partial $\eta^2=.539$); handling disagreements ($F=185.991$, $df=3$, $p<.000$, Partial $\eta^2=.533$); and ending relationships ($F=49.713$, $df=3$, $p<.000$, Partial $\eta^2=.237$). Cell means are reported in Figure 1. All means are significantly different across channels for each communication activity.

Figure 1: Social Capital Functions by Technology

Function	Instant Messenger	Cell Phone	Face-to-Face	Email
Relationships enhanced	3.5655a	4.0298a	4.5179a	2.7500a
Use to talk with professors	1.4268b	1.8963b	3.8963b	4.3171b
Get information about classes	3.4485c	3.4242c	3.9455c	4.1455c
Talk through problems at school	3.3727d	3.6273d	4.0311d	2.6957d
Talk about personal problems	3.6970e	3.9636e	4.0606e	2.5576e
Talk about family problems	3.0549f	3.7683f	3.9634f	2.5366f
Friends don't hesitate to tell the truth	3.4601g	3.2699g	3.7423g	2.9939g
Get to know people	3.3865h	3.2331h	4.5092h	2.2699h
Good way to handle disagreements	2.5061i	2.8232i	4.4207i	2.1159i
Good way to end relationships	2.0994j	2.2112j	4.8261j	1.7826j

Means with common subscripts are significantly different $p \leq .001$

Respondents reported a strong preference for cell phones: 63.3% agreed or strongly agreed that they couldn't keep up with their friends without a cell phone (M = 3.71) and 72.4% agreed or strongly agreed that they would be lost without their cell phone (M = 3.99).

Face-to-face interaction is clearly preferred as a means for enhancing relationships although cell phone use is also viewed as an important channel for this communication activity.

Interaction with university faculty falls clearly within the realm of email. Results for solving school, personal, and family problems privileges face-to-face interaction. The truth is often a scarce commodity but seems to emerge most frequently, according to respondents, via face-to-face interaction although the means for cell phones and instant messenger suggest that actors will share the truth in this way. Getting to know people is clearly the province of face-to-face interaction with the other modalities less preferred but nonetheless utilized. Face-to-face interaction is clearly preferred for the management of conflict and for the termination of relationships.

Discussion

Despite the availability of multiple networks that make communication possible in virtually any context and at any time, college students report that they are selective about how social capital is formed, maintained, and used. While respondents have amazingly large numbers of network contacts listed in places such as cell phones, instant messaging applications, and e-mail address books, they communicate with a smaller subset of those individuals on a regular basis and roughly one third of those connections were also supported through face-to-face interaction.

The large numbers of network connections reported above attest to the substantial number of weak ties managed by college students. Current technologies make the creation and maintenance of weak ties more easily accomplished. A common sight at any university is that of students standing together, cell phones in hand, entering each other's contact information. This ease of creating weak tie connections offers a greatly expanded network of potential contacts without the necessity of continued commitment or maintenance. After all, one can push the "ignore" button on the cell phone, the "away" icon on instant messenger, or "delete" in one's e-mail application to control when and where weak ties invade one's consciousness. These weak ties hold the potential for action and information when the need arises, and this need can be satisfied quickly and without the necessity of face-to-face interaction. This works best when face-to-face interaction implies some level of involvement beyond the bounds of the more immediate need for action or information.

The previous suggests that weak ties are not all the same. To borrow from physics, weak ties come in flavors. Some ties remain pure potential, resident in cell

phone, email, or instant messenger memory but not normally activated and sometimes forgotten. Other ties remain largely unused but remembered and ready for use if memory serves and the appropriate need arises. The point is that some weak ties are maintained using technology with tie partner information resident in memory until or if needed.

While weak ties require less maintenance, strong ties require much more face-to-face interaction. Face-to-face interaction remains the preferred means of communication for college students, with the exception of their interactions with university faculty members, and it is preferred for handling difficult tasks such as relational dissolution and conflict. However, technology emerges as an important component that allows the cultivation, maintenance, and use of strong ties. Therefore, technology use occupies a significant part of respondent's communication over the course of a day and impacts how strong ties are created, kept, and used.

Of particular interest in the findings is the significance that students assign to technologies such as cell phones. One of the authors recently quizzed his students to find out that they all had cell phones, about a third did not have a traditional telephone, all of the students felt that it was important to have their cell phones with them at all times, and nearly all thought having a really "cool" cell phone was important. This purely anecdotal information echoes the importance students attach to technology in general and cell phones in particular. One simply has to ask students to calculate some kind of math problem and cell phones, not calculators, immediately emerge as the preferred method. However, college students will soon be taking their place in contemporary organizations that have more traditional and perhaps less technology based preferences for certain kinds of social capital formation, maintenance, and expenditure. Students are attached to their cell phones and other technologies and rely on them as a means of interaction in many situations. A collision of preferences may occur as today's college students take their place in organizations and find that the interactive environment they are entering does not appreciate the pattern of technology use they value so highly.

Associated with the attachment to technology is its use in maintaining social contacts. At the end of each class, students pause before they leave their seats to retrieve their cell phones and to check for messages and make calls. One wonders what has to be discussed an 9 a.m. in the morning with such animated urgency, but the sounds of chatting soon fill the room as students exit for their next classes. Apparently for some, the creation, maintenance, and utilization of social capital requires nearly constant attention.

The results also indicate that the use of technology centers on social (rather than work or task) issues. It is interesting to consider how student preferences for immediate and continuing social interaction will mesh with organizational environments that are intensely task oriented. One possible conflict may be the level of reliance on technology that some organizations are unwilling or unable to support. There will be an

adjustment process as students come to understand that organizational communication does not necessarily involve large amounts of social interaction via instant messaging, e-mail, cell phone calls, and face-to-face interaction.

Lin's (2001) discussion of what he labels the "like me" hypothesis suggests that there is a tendency to interact within a network of homogeneous actors. Coleman (1988) was supportive of this version of social capital suggesting that it arose in closed networks. However, the need to cross what Burt (1992) calls structural holes is not necessarily a characteristic common in the population studied in this research. While college age individuals readily exchange phone numbers, many remain unutilized in favor of smaller number of contacts most frequently accessed. So, there is some evidence for a relatively closed network of similar individuals concerned with social (and to a certain extent academic) interests. One might accordingly speculate on the difficulties encountered where college graduates accustomed to social capital acquired, kept, and used in relatively closed networks focused on social issues, find themselves in contexts with very different visions of social capital. The point is that not all visions of social capital are similar; rather, they are constructed, negotiated, and renegotiated on a local level.

The results of this survey do not suggest that college students are losing the ability to create and form social capital. Instead, they seem to spend a significant amount of time using various technologies, now increasingly mixed with face-to-face interaction, to build, maintain, and use strong ties while managing sometimes quite large networks of weak ties. The result may be that social capital is evolving in terms of how younger individuals view and cultivate it. As a new generation for whom technology is a regular and common part of the interactive frame of human life and living, it is natural for them to use the technologies that surround them skillfully and in ways that make intuitive sense to them and the networks in which they reside. While this is a different approach from traditional formulations, it does not signal the ultimate demise of cooperativeness, civicness, or connectedness in society. These findings and interpretations suggest that young people have their own patterns of interaction that connect them in ways they find satisfying and enriching even if those of other generations, cultures, and experiences feel a bit left out.

Of particular concern will be how individuals who have very different approaches to social capital formation, maintenance, and expenditure will be able to come together to act in cooperative ways. The real issue may become not the general decline of social capital but rather the collision of various approaches to its creation, maintenance, and use. Thus, the communication dimension of social capital becomes an especially important addition to traditional social capital framework, acknowledging that social capital is not a concept of unitary application by all people in all places, but that individuals have preferences, styles, and approaches to social capital. These preferences may facilitate or hinder social capital formation, maintenance, and utilization. The communication competence literature (Spitzberg & Cupach, 1984), for example, has long acknowledged that humans are not uniformly equipped to maintain

relationships in a successful manner. This is why some relationships dissolve, become dysfunctional, or even dangerous and it is also the reason why social capital is utilized in ways that sometimes brings negative results.

There are, of course, limitations to this research. One in particular lies in the shifting nature of the use of technological communication. When the data for this paper was gathered Thefacebook was a new and emerging technology although there was considerable "buzz" among students. At the time of this writing, Thefacebook has widely diffused, but many students have migrated to Myspace, perceiving advantages and features not thought to be available in Thefacebook. Now students are beginning to "buzz" about Second Life an alternate reality application in which individuals create avatars and create, maintain, and utilize social capital in an alternate reality. The point is that technological preferences change and often quite rapidly so that what emerges from any analysis is a snapshot of perceptions, preferences, and uses at one time and in one place. Moreover, this suggests a new avenue of investigation, i. e., the study of technological migration patterns among those who engage in technological communication.

This discussion suggests that social capital is not a unitary and unchanging concept. Rather, while the core principle of the concept remains constant the manner in which it becomes manifest, maintained, and utilized can and does change rapidly especially where technology drives social change. Even in nations presumed to remain reliant on face-to-face interaction for social capital creation, maintenance, and utilization the preferences for and uses of various technologies portends change. In Malaysia, for example, cell phone penetration stands at nearly 80%. In China internet cafes, while illegal and closely monitored by the government, are exerting influence on the communication preferences of the young. In Indonesia young Muslim men surreptitiously visit internet cafes to participate in a form of interaction and information exchange strongly discouraged by their conservative elders. The limitation here and the challenge for the future lies in understanding and documenting rapid change in the manner in which social capital is created, maintained, and utilized and the collisions between various perceptions of this process.

In sum, this paper demonstrates that social capital involves a choice among various communication technologies. The preference for and attachment to cell phones, instant messaging, and e-mail and the willingness to use technology as a part of an approach to engaging in social capital formation, maintenance, and use marks college age individuals as unique. Further, these results suggest a collision of sorts in which individuals with very diverse approaches to social capital must find ways to come together, to adapt, and to cooperate to produce the very outcomes that many social capital theorists have lamented the loss of.

References

Adam, F. & Roncevic, B. (2003). Social capital: Recent debates and research trends. *Social Science Information, 42(2), 155183.*

Aiken, M., Vanjani, M., Ray, B., & Martin, J. (2003). College student Internet use. *Campus-Wide Information Systems, 20,* 182-185.

Allik, J., & Realo, A. (2004). Individualism-collectivism and social capital. *Journal of Cross-Cultural Psychology, 35,* 29-49.

Aoki, K., & Downes, E. J. (2003). An analysis of young people's use of and attitudes toward cell phones. *Telematics and Informatics, 20(4),* 349-364.

Bargh, J. A., & McKenna, K. Y. A. (2004). The Internet and social life. *Annual Review of Psychology, 55,* 573-590.

Bimber, B. (1998). The Internet and political transformation: Populism, community, and accelerated pluralism. *Polity, 31,* 133-160.

Boase, J., Horrigan, J. B., Wellman, B., & Rainie, L. (2006). The strength of Internet Ties: The internet and e-email aid users in maintaining their social networks and provide pathways to help when people face big decisions. Retrieved February 23, 2006, from the Pew Internet & American Life Project Web site: http://www.pewinternet.org.

Borgida, E., Sullivan, J. L, Oxendine, A., Jackson, M. S., Riedel, E., & Gangl, A. (2002). Civic culture meets the digital divide: The role of community electronic networks. *Journal of Social Issues, 58(1),* 125-141.

Botan, C., and Hazleton, V. (2006). Public relations in a new age. In C. Botan and V. Hazleton (Eds.), Public relations theory II (pp. 1-18). Mahwah, NJ: Lawrence Erlbaum Associates.

Botan, C., and Taylor, M. (2004). Public relations state of the field. *Journal of Communication*, *54*, 645-661.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241-258). New York: Greenwood Press.

Burt, R. S. (1992). *Structural Holes: The Social Structure of Competition*. Cambridge, MA: Harvard University Press.

Burt, R. S., & Knez, M. (1995). Third party effects on trust. *Rationality and Society, 7,* 255-292.

Caplan, S. E. (2003). Preference for online social interaction: A theory of problematic Internet use and psychosocial well-being. *Communication Research, 30(6),* 625-648.

Coleman, J. S. (1988). Social capital in the creation of human capital. *The American Journal of Sociology, 94,* S95-S120.

Cummings, J. N., Butler, B., & Kraut, R. (2002). The quality of online social relationships. *Communications of the Association for Computing Machinery, 45(7),* 103-108.

Donath, J. (2002). A semantic approach to visualizing online conversations. *Communications of the Association for Computing Machinery, 45(4),* 45-49.

Flanagin, A. J. (2005). IM online: Instant messaging use among college students. *Communication Research Reports, 22,* 175-187.

Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Prosperity.* New York: Free Press.

Fussell, H., Harrison-Rexrode, J., Kennan, W., & Hazleton, V. (2006). The relationship between social capital, transaction costs, and organizational outcomes: A case study. *Corporate Communications: An International Journal,* 11(2), 148-161.

Glaeser, E. L. (2001). The formation of social capital. *Canadian Journal of Policy Research, 2,* 381-393.

Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology, 78(6),* 1360-1380.

Grinter, R., & Palen, L. (2002, November). Instant messaging in teen life. In *Proceedings from the 2002 ACM conference on Computer Supported Cooperative Work* (pp. 21–30). New York: Association for Computing Machinery Publishers.

Hampton, K. N., & Wellman, B. (1999). Netville on-line and off-line. *American Behavioral Scientist, 43(3),* 475-492.

Hanson, L. (2005, November 16). Student networking is in-your-facebook. The Indianapolis Star. Retrieved February 28, 2006, from http://www.indystar.com.

Hazleton, V., & Kennan, W. (2000). Social capital: Reconceptualizing the bottom line.

Corporate Communications: An International Journal, 5(2), 81-87.

Hazleton, V., & Kennan, W. (2006). Internal public relations, social capital, and the role of effective organizational communication. In C. Botan & V. Hazleton (Eds.), *PR Theory II* (pp. 311-338). Mahwah, NJ: Lawrence Erlbaum Associates.

Hu, Y., Wood, J. F., Smith, V., & Westbrook, N. (2004). Friendships through IM: Examining the relationship between instant messaging and intimacy. *Journal of Computer-Mediated Communication, 10(1)* Retrieved February 28, 2006 from http://jcmc.indiana.edu.

Igarashi, T., Takai, J., & Yoshida, T. (2005). Gender differences in social network development via mobile phone text messages: A longitudinal study. *Journal of Social and Personal Relationships, 22(5),* 691-713.

Jones, S. G. (1995). *Cybersociety: Computer-mediated communication and community.* Thousand Oaks, CA: Sage.

Katz, J. E., & Aspden, P. (1997). A nation of strangers? *Communications of the Association for Computing Machinery, 40,* 81-86.

Kavanaugh, A. L., Carroll, J. M., Rosson, M. B., Zin, T. T., & Reese, D. D. (2005). Community networks: Where offline communities meet online. *Journal of Computer Mediated Communication, 10(4).* Retrieved February 27, 2006 from http://jcmc.indiana.edu.

Kavanaugh, A. L, & Patterson, S. J. (2001). The impact of community computer networks on social capital and community involvement. *The American Behavioral Scientist, 45(3),* 496-513.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., &

Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological wellbeing? *American Psychologist, 53,* 1017-1031.

Lee, K. C., & Perry, S. D. (2004). Student instant message use in an ubiquitous computing environment: Effects of deficient self-regulation. *Journal of Broadcasting and Electronic Media, 48(3),* 399-421.

Lin, N. (2001). *Social Capital: A Theory of Social Structure and Action*. Cambridge; New York: Cambridge University Press.

Lin, N. (2001). Building a network theory of social capital. *Connections*, 22(1), 28-51.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23,* 242-267.

Nie, N., & Erbring, L. (2000). Internet and society: A preliminary report [Online]. Available URL: http://www.stanford.edu/group/siqss/Press_Release/internetStudy.html

Onyx, J., & Bullen, P. (2000). Measuring social capital in five communities. *The Journal of Applied Behavioral Science, 36(1),* 23-39.

Portes, A. (1998). Social capital: Its origins and applications in modern society. *Annual Review of Sociology, 22,* 1-25.

Putnam, R. D. (1995a). Bowling alone: America's declining social capital. *Journal of Democracy, 6,* 65-78.

Putnam, R. D. (1995b). Tuning in, tuning out: The strange disappearance of social capital in America. *PS: Political Science and Politics, 28(4),* 664-683.

Quan-Haase, A., Cothrel, J., & Wellman, B. (2005). Instant messaging for collaboration: A case study of a high-tech firm. *Journal of Computer Mediated Communication, 10(4).* Retrieved February 28, 2006 from http://jcmc.indiana.edu.

Quan-Haase, A., & Wellman, B. (2004). How does the Internet affect social capital? In M. Huysman & V. Wulf (Eds.), *Social Capital and Information Technology* (pp. 113-132). Cambridge, MA: MIT Press.

Read, B. (2004). Have you 'facebooked' him? *The Chronicle of Higher Education,* 29-31.

Resnick, P. (2002). Beyond bowling together: Sociotechnical capital. In J. M. Carroll (Ed.), *Human computer interaction in the new millennium (*pp. 647-672). Toronto: Association for Computing Machinery Press.

Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier.* New York: HarperCollins.

Ruppel, M., & Fagan, J. C. (2002). Instant messaging reference: Users evaluation of library chat. *Reference Services Review, 30,* 183-197.

Scott, J. K., & Johnson, T. J. (2005). Bowling alone but online together: Social capital in e-communities. *Journal of the Community Development Society, 36(1),* 9-28.

Seibert, S. E., Kraimer, M. L., & Liden, R. C. (2001). A social capital theory of career success. *Academy of Management Journal, 44(2),* 219-237.

Shah, D. V., Kwak, N., & Holbert, R. L. (2001). "Connecting" and "disconnecting" with civic life: Patterns of Internet use and the production of social capital. *Political Communication, 18,* 141-162.

Shah, D. V., Cho, J., Eveland, W. P., & Kwak, N. (2005). Information and expression in a digital age: Modeling Internet effects on civic participation. *Communication Research, 32,* 531-565.

Shah, D. V., McLeod, J. M., & Yoon, S. (2001). Communication, context, and community: An exploration of print, broadcast, and Internet influences. *Communication Research, 28(4)*, 464-506.

Shah, D. V., Schmierbach, M., Hawkins, J., Espino, R., & Donavan, J. (2002). Nonrecursive models of Internet use and community engagement: Questioning whether time spent online erodes social capital. *Journalism and Mass Communication Quarterly, 79(4),* 964-987.

Smith, A., & Williams, K. D. (2004). R u there? Ostracism by cell phone text messages. *Group Dynamics: Theory, Research, and Practice, 8,* 291-301.

Spitzberg, B. H. & Cupach, W. R. (1984). *Interpersonal Communication Competence*. Beverly Hills, CA: Sage.

Trice, A. D. (2002). First semester college students' e-mail to parents: I. Frequency and content related to parenting style. *College Student Journal, 36(3),* 327-335.

Wallace, P. M. (1999). *The Psychology of the Internet*. New York: Cambridge University Press.

Wei, R., & Leung, L. (1999). Blurring public and private behaviors in public space: Policy challenges in the use and improper use of cell phones. *Telematics and Informatics, 16,* 11-26.

Wellman, B., Hasse, A., Witte, J., & Hampton, K. (2001). Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. *The American Behavioral Scientist, 45(3),* 436-459.

Wellman, B., & Gulia, M. (1999). Net surfers don't ride alone. In B. Wellman (Ed.), *Networks in the global village* (pp. 331-366). Boulder, CO: Westview Press.

Wellman, B., Carrington, P., & Hall, A. (1988). Networks as personal communities. In B. Wellman & S. D. Berkowitz (Eds.), *Social structures: A network approach* (pp. 130-184). Cambridge: Cambridge University Press.

Yli-Renko, H., Autio, E., & Tontti, V. (2002). Social capital, knowledge, and the international growth of technology-based new firms. *International Business Review, 11(3),* 279-305.