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Social Interactions across Media: Interpersonal Communication on the Internet, Face-to-Face, and the Telephone

Nancy K. Baym
Yan Bing Zhang
Department of Communication Studies
102 Bailey Hall, 1440 Jayhawk Blvd.
University of Kansas
Lawrence, KS 66045-7574
Phone: 785-864-3633 fax: 785-864-5203

Mei-Chen Lin
School of Communication Studies
P. O. Box 5190
Kent State University
Kent, OH 44242-0001

Paper citation:

Keywords:
internet, social interaction, media, face-to-face, telephone, interpersonal communication

Abstract:
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Nancy K. Baym (Ph.D,, University of Illinois) is an Associate Professor in the Communication Studies Department at the University of Kansas. She is the Association of Internet Researcher's first Vice-President, and second President.

Yan Bing Zhang (Ph.D., University of Kansas, 2002) is an Assistant Professor in the Communication Studies Department at the University of Kansas. Her research is on intercultural/intergenerational communication, particularly in regard to cultural values, social cognition, and media effects. Her work has been published in *Journal of Broadcasting & Electronic Media*, *Journal of Asian Pacific Communication*, and *The Hallym International Journal of Aging*.

Mei-Chen Lin (Ph.D., University of Kansas, Lawrence, KS, 2003) is an Assistant Professor in the School of Communication Studies at Kent State University. Her research focuses on intergenerational communication in cross-cultural contexts, and older people's age identity in language use. Her research draws on theories of social identity, and communication accommodation theory. Her recent publications have appeared in *Journal of Social and Personal Relationships* and *Journal of Language and Social Psychology*.

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Abstract

Two studies were conducted in this investigation to compare college students' interpersonal interaction online, face-to-face, and on the telephone. Our first study, a communication diary, assessed the relative amount of social interactions college students conduct via the internet in comparison to face-to-face conversation and telephone calls. Results indicated that the internet was used nearly as often as the telephone, however, face-to-face communication was far more frequent. The second study, a survey, compared reported use of the internet within local and long distance social circles to the use of other media within those circles, and examined participants' most recent significant social interactions conducted online, face-to-face, and on the telephone in terms of purposes, contexts, and quality. Major findings included that online interaction was perceived as high in quality, but slightly lower than telephone calls and face-to-face conversations. Use of the internet was positively correlated with the use of other modes of interpersonal communication. Ttogether, results show that the internet is integrated into social life, but face-to-face remains the dominant mode of interpersonal communication.

Keywords: internet, social interaction, media, face-to-face, telephone, interpersonal communication

Socializing with others is among the most popular uses of the internet (Pew Project on the Internet and American Life, 2000; UCLA Center for Communication Policy, 2000). This has prompted considerable speculation and disagreement about the nature and consequences of online social contacts. As we review below, the collective findings of the recent burst research on the internet "can be interpreted to support or refute the claim that the internet is a solitary activity, harmful to social relations with others" (Haythornthwaite & Wellman, 2002, p. 24; Nie & Erbring, 2000; Pew Internet Project, 2002). This paper argues that understanding the role of the internet in social life requires that we differentiate amongst the wide variety of online activities, recognize that individual relationships can be maintained through multiple media, acknowledge that internet use is shaped by user choices, and make direct comparisons between internet social contacts and other means of pursuing social contact. This paper presents two studies that compare interpersonal interaction online, face-to-face, and on the telephone in a population of American college students who used the internet to socialize.

Our first study, a communication diary, assessed the relative amount of social interactions college students conduct via the internet in comparison to face-to-face conversation and telephone calls over the course of several days. The second, a survey, compared reported use of the internet within local and long distance social circles to the use of other media within those circles, and compares participants' most recent significant social interactions conducted online, face-to-face, and on the telephone in terms of purposes, contexts, and quality. Together the two studies examined the relative place of online social contact in the naturalistic patterns of typical days and to directly compare online social activity to socializing in other media.

The Need to Differentiate Online Activities

A common strategy in assessing the social and personal well-being consequences of the internet has been to compare people based on their amount of internet use. Though rarely articulated, this positions the internet as a technologically-deterministic force. The internet is seen as a single entity that influences its users through sheer exposure. As Jung, Qui, and Kim (2001) note, using internet exposure as an independent variable presumes the direct effects model cast out of media studies decades ago. Instead, the internet should be treated as "a cultural devise used to achieve social and cultural goals" (Matei & Ball-Rokeach, 2002, p. 408). The pursuit of those goals should provide the starting point for analysis rather than totalizing measures of all internet use (which includes activities as varied as staying in touch with far-away friends, arranging appointments, banking, shopping, listening to music, reading news, and viewing pornography).

Nonetheless, many of the most influential and widely publicized studies of the internet's role in sociability compare internet users and nonusers, heavy and light users, or experienced and new users. The findings are mixed. The first paper from the Carnegie-Mellon Homenet Project (Kraut, Patterson, Lundmark, Kiesler, Mukhopadhyay, & Scherlis, 1998) and Nie and his collaborators (Nie & Erbring, 2000; Nie, Hillygus, & Erbring, 2002) associate internet use with negative social outcomes including less time spent with family and friends, less total social involvement, and more loneliness and depression. On the other hand, Kraut, Kiesler, Boneva, Cummings, Helgeson, and Crawford's (2002) follow-up analysis of the Homenet sample a year later found these negative associations were gone, suggesting the importance of user experience (see also LaRose, Eastin, & Gregg, 2001). The UCLA Center for Communication Policy (2000) found no reported differences in socializing with friends since going online, but did find that

experienced users report spending slightly less time with family than new users. UCLA's

comparisons of internet users and non-users found no differences in the amount of friends seen

or spoken with at least once each week or amount of friends outside their household. The Pew

Internet Project (2000) found that internet users were more likely than non-users to have visited

family or friends "yesterday" and spent more time with clubs and volunteer organizations.

Robinson, Kestnbaum, Neustadtl, and Alvarez (2002) examined time diary data and found that

internet users spent three times more time attending social events and reported significantly more

conversation than non-users. One reason that these findings are so mixed may be the conflation

of all internet activities into one. In contrast to this approach, we begin with the activity of social

interaction. Our first research question aims to specify which internet media (e.g. email, instant

messaging, chat, MUDs, newsgroups, web boards, multiperson role playing games) college

students used in their significant social interactions.

RQ 1: What kinds of internet media do college students report using for significant social

interactions?

The Need to View Relationships As Maintained Through Multiple Media

Conceptualizing the internet as a causal monolith makes it easy to imagine that there is a

"cyberspace" that exists apart from everyday life rather than integrated into it (e.g.,

Haythornthwaite & Wellman, 2002; Miller & Slater, 2000). This perspective often presumes the

inferiority of "cyberspace" in contrast to "real" space. Kraut et al. (1998), for instance, argued

that poorer quality, weak tie, Internet social relationships may be substituted for better (i.e. face-

to-face) relationships, or time spent online might otherwise be spent forming strong tie (i.e. face-

to-face) relationships. Both perspectives set the internet in juxtaposition to and competition with

a world of strong, deep, rewarding face-to-face relationships. Nie et al. (2002) claimed that

"virtual contact may be more superficial than that which occurs in more personal settings" and

that email "appears to imply an obvious tradeoff between quantity and quality of social

interaction" (p. 238). Such a "tradeoff" is only "obvious" if one believes the Iinternet is both

separate and significantly different (i.e. more impersonal) from the theoretically privileged world

of face-to-face social contact.

The view of the internet as inherently unreal has become ever-more problematic as

research has demonstrated that most of the online interactions are between people who have also

talked on the telephone or met face-to-face (Miller & Slater, 2000; Pew Internet Project, 2000;

UCLA Center for Communication Policy 2000, 2001, 2002). Relationships are maintained

through multiple media. One goal of this paper is to examine how internet interactions are woven

into the daily maintenance of relationships (i.e., telephone conversations and face-to-face

interactions). Specifically, we examined the following research questions:

RQ2: What are the relative frequencies of significant voluntary social interactions college

students report conducting on the internet in comparison to face-to-face conversations and

telephone calls?

RQ 3: How many media do students report using for significant social interactions over a

3-5 day time span?

RQ4: What are the relative percentages of students' social relationships that are

maintained at least in part through the use of the internet in comparison to those maintained at

least in part through face-to-face communication, telephone calls, and mail?

RQ5: On average, how many relationships are sustained *only* through the internet?

*The Need To Consider Multiple Influences On Social Internet Us*e

In examining the telephone's diffusion into daily life, Fischer (1992) argued that "users try to put a new technology to their own ends, which can lead to paradoxical outcomes not easily deducible from the straightforward logic of the technology" (p. 269). This perspective of social shaping of technology emphasizes the users' active roles in making choices about how to engage technologies depending on their circumstances, personality traits, and needs. How people choose to use the internet socially is influenced by their relationships, including their geographical distance and type, and individuals' pre-existing sociability (Dimmick, Klein, & Stafford, 2000). They propose that online social interaction fills a different niche from telephone interactions in long distance communication. Their interviews showed that email was considered superior to the telephone for keeping in touch with people who lived far away and in different time zones. Nearly half their respondents said they used long distance telephone less now that they were online. Interpersonal media use also seems to depend in part on the kinds of relationships in which people communicate. Large-scale international survey studies conducted through the National Geographic website (Chen, Boase, & Wellman, 2002; Quan-Haase, Wellman, Witte, & Hampton, 2002) examined the reported frequency of weekly contact with relatives and friends face-to-face, on the telephone, and email. Chen et al. (2002) compared near (within 50 km) versus far-away friendships and family relationships. They found that locally, the telephone was used most. In long distance relationships, email predominated. Regardless of distance, email was used more with friends than relatives. Quan-Haase, Wellman, Witte, and Hampton (2002) found that email and face-to-face communication each comprised 29% of all contact with nearby friends. With local kin, however, email was less frequent, constituting 17% of all contact compared to the 27% conducted face-to-face. In distant relationships, Quan-Haase et al. (2002)

found that 49% of all social contact with kin was conducted online, while 62% of interactions with friends used the internet.

The extent to which people use the internet and other media interpersonally also seems to be driven by the users' underlying sociability. Matei and Ball-Rokeach (2002) looked at the strength of local ties that internet users in Los Angeles. They found that the stronger one's local ties, the more likely one was to meet new people online. Chen et al. (2002) found that the more subjects reported emailing family, the more they reported interacting with them face-to-face and on the telephone. Copher, Kanfer, and Walker (2002) had community leaders keep diaries of "all communications involving the transmission of information beyond a simple greeting" for one week and compared the results of heavy and light email users. Subjects also completed a survey about their communication partners or "alters". They found that heavy email users had "greater numbers and percentages of communications, time spent communicating, and alters than light email users" (Copher et al., 2002, p. 274). For personal (as opposed to work) communications, heavy email users used proportionately more face-to-face communication than light users (Copher et al., 2000). Analyses such as these bear repeating in other populations. We thus pose these general research questions:

RQ6: How does college students' use of communication media to maintain relationships differ when the relationships are local, long distance, close local, and close long distance?

RQ7: Does college students' use of the internet in their social circles correlate with the use of other media within those circles?

The Need for Comparative Analysis of Interactions

Ultimately, the primary reason for concern about the consequences of online interaction would be that there are meaningful differences between online interaction and other means of

socializing. However, very little research has directly compared interactions across media. Cummings, Butler, and Kraut (2002) had students keep interaction diaries. For each interaction, subjects were asked to assess the medium's usefulness for achieving purposes including getting work done, maintaining relationships, and exchanging information. They found that the internet was rated worse for maintaining relationships, and better for getting schoolwork done and exchanging information. They concluded that email was inferior to phone calls or face-to-face meetings for relational communication.

As they acknowledged, their sampling procedure in which students were asked to record all interactions in a four-hour block may have resulted in data filled with insignificant interactions. To mitigate against this problem in the current studies, we asked subjects to report only "significant" social interactions, leaving it to them to determine what constituted "significance." Cummings et al.'s (2002) measures are also problematic in that they conflate interaction quality with interaction purpose, as the sole measure of quality were participants' ratings of how useful the medium was for specified purposes. We separated quality of interaction from purpose. In order to directly compare online social contacts to those conducted in other media, we propose three research questions, which assessed the interactions in terms of their purposes, contexts and quality. These variables, while far from exhaustive, together describe interactions from a variety of perspectives.

RQ8: Are media used in different amounts depending on the purpose of the interaction (social vs. non-social)?

RQ9: How do the physical contexts (location, local vs. long distance, presence of others, engagement in other activities) of online interactions differ from those in other media (face-to-face conversations and telephone calls)?

RQ10: Does the perceived quality of interaction depend on medium (face-to-face,

internet, telephones), relationship (romantic partner, friend, family member, acquaintances),

purpose (social/non-social), or interactions amongst these variables?

Study 1: Diary

To examine our research questions about internet use and frequency relative to other media within the context of ongoing daily life, we began by having students keep interaction diaries over the course of several days. Interaction diaries provided a detailed portrait of the flow of spontaneous social interaction (Duck, 1991; Duck, Rutt, Hurst, Strejc, 1991; Reis & Wheeler, 1991).

Methods

Participants

Fifty-one students (*M* age = 22.42, *SD* =3.64) at two large Midwestern universities were recruited from introductory public speaking courses and received course credit for their participation. Participants had to meet the minimal criterion of identifying themselves as someone who "socializes over the internet." College students represent a particularly appropriate sample through which to understand the rise of the internet in social life, given their status as "pioneers" for whom social internet use has already become frequent and mundane (Pew, 2002). Furthermore, college represents a time in life during which people are particularly likely to be learning how to use and integrate multiple means of communication in their social lives (Pew, 2002). The Pew study of college student use of the internet found that 42% of students said they socialized online, more than engaged in any other online activity. The average student spent 1-3 hours a week in online social communication.

There were 36 (70.6%) females and 14 (27.5%) males. Among the 51 participants, there were 35 white, 6 African American, 5 Hispanic, 3 Asian Islanders, 2 other. Participants reported that they had used the computer for 11.39 years (*SD* = 3.29) and had been on line for 5.59 years (*SD* =1.76).

Materials and Procedures

Participants completed a survey assessing demographic information and computer and internet use history. They were then asked to complete a record of each "significant voluntary social interaction" in which they engaged during the next three to five day period. The interactions represented by these logs are a subset of a person's total significant. The interaction record noted the medium through which the interaction was conducted. By collecting these records over a span of several days, we were able to access a typical sample of each subject's everyday social life. The 51 students recorded 862 interactions. Study one addressed the first three questions.

Results

The first research question asked what types of internet interaction were used for significant voluntary social interactions. Almost all of the internet interactions which participants reported were email (72.79%), chat (19.85%), and instant messaging (7.35%). No interactions were identified as taking place in newsgroups, MUDS, role-playing games, or any of the other internet-enabled communication formats.

The second research question asked about the frequencies of significant voluntary social interactions conducted face-to-face, on the telephone, and on the internet. The specific medium used in 9 of the 862 interactions were unidentified and thus were dropped from this analysis. Of the 851 interactions, most (64%) were face-to-face. There were only slightly fewer internet interactions (16.1%) than telephone calls (18.4%).

Our third research questions asked how many and which combinations of media individuals reported using for significant social interactions within a 3-5 day time span. As seen in Table 1, the diaries showed people conducting their social lives through at least two and often

three channels on any given day. Among the 51 participants, only one person reported exclusively face-to-face interactions or internet interactions during the reported days. Thirty-two people (64%), in contrast, reported conducting interactions face-to-face, on the phone, and online. Thirteen people reported no significant internet interactions. Six people reported no significant telephone calls. Two did not report any face-to-face conversations.

Insert Table 1 Here

Discussion

These diaries demonstrated an online social life that was both connected to communication in other media and had its own limited but pervasive use in interpersonal communication. Although these users were adept at using the internet socially and had integrated it into their daily lives, face-to-face communication clearly remained their dominant mode of interaction. This is in contrast to Chen et al's (2002) finding that the telephone was the most frequent communication medium. There were nearly as many internet interactions as there were telephone interactions, supporting previous studies (Dimmick et al., 2000; Flanagin & Metzger, 2001; Stafford, Kline, & Dimmick, 1999) which found that the internet has come to rival the telephone as a medium for conducting personal relationships.

The online interactions students identified as significant were overwhelmingly conducted through email and, to a lesser extent, chat and instant messaging. In contrast to public spaces such as web boards or chat rooms, these modes of online interaction often privilege communication with people whose email addresses or screen names were acquired face-to-face. This suggests that much of the significant social interaction these students reported having online was likely conducted in multimedia (rather than "online") relationships.

The diary study collected rich data on social interaction from a small set of students over time and hence provided insights into the relative use of each medium in daily social interactions. However, because the interactions were all collected from the same 51 students (i.e. were not independent), we were unable to compare interactions. This sample size also limited the generalizations we can draw. Our second study used a survey with a larger sample and collected only one interaction from each student. We also controlled for the frequencies of interactions reported in each medium and for the kinds of relationships in which people reported interacting.

Study 2: Survey

This second study revisited the first research question examined in Study 1, and answered

our remaining questions regarding the relative use of the internet within students' social circles

and the comparative purposes, contexts, and quality of online (versus face-to-face or telephone)

interaction.

Methods

Participants

Four hundred and ninety-six college students (M age = 20.67, SD = 1.63) were recruited

from a Midwestern university. They received course credit for their participation. Participants

had to meet the minimal criterion of identifying themselves who "socialize over the internet."

Among the 496 participants, there were 40.9% (n = 203) males and 58.9% (n = 292) females.

The majority of the participants were White (n = 424), twenty were Asian/Pacific Islanders,

twenty were African American, thirteen identified their races as "other", eleven as

Hispanic/Mexican Americans, four as Native American, and one did not identify any race.

Participants reported an average of 7.37 years of experience in using computers (SD = 2.81), and

5.33 years of experience of using the internet (SD = 1.72).

Materials and Procedures

Participants were asked to answer questions about their most recent significant social

interactions in order to minimize the effects of memory distortion. First, we controlled for the

medium of the interaction (3 types: face-to-face, phone, internet) and relationship type (4 types:

acquaintances, friends, family members, and romantic partners). Thus, there were 12 version of

the survey, and participants were randomly given one of the 12 questionnaires (e.g., a face-to-

face interaction with a friend, a phone conversation with a family member, or an internet

interaction with a romantic partner). There were a few instances that participants were not able to recall the type of the interaction as described by the survey. These participants were given a different version of the survey. In all, a third of the participants were asked to report their most recent significant face-to-face conversation, a third to recall a telephone call, and a third to recall an online interaction. Within each medium, a quarter reported conversations from each relationship type. Surveys were randomly ordered before distribution. In addition to describing the interaction, participants were asked to answer a series of questions about the history of their computer use, communication in their social circles, and perceptions of quality of interaction.

First, participants answered questions about communication in their social circles. Local social circle was defined as "the number of people, including relatives and friends, in the same town with whom you keep in touch at least once a month" (Kraut et al., 1998). The distant social circle was defined as "the approximate number of people, including relatives, work colleagues, and personal friends, outside of the [town name] area whom you keep in touch with at least once a year" (Kraut et al., 1998). Within the local and long distance social circles, participants were asked to estimate how many people they were close to and, of those, what percentage they communicated with using each medium. Participants estimated how many people they interacted with within each of their social circles (local, close-local, distant, close-long distant) by circling a number (1 = 0-5 people, 2 = 6-10 people, 3 = 11-15 people, 4 = 16-20 people, 5 = 21-25 people and 6 = more than 26 people). They also provided a specific number within the range that they circled. Participants were asked to estimate the percentage of each social circle with whom they communicated using each medium (i.e., face-to-face, phone, internet, mail) by giving a number between 0 and 100 % for each medium. Finally, participants specified the number of people in their social circles they interacted with *only* through the internet.

Participants reported on their most recent interactions within a specified type of

relationship through a specified medium (e.g., a family member on the phone). Participants who

reported online interactions were asked to specify types of internet use (email, instant message,

or others). All participants were asked to report the purpose of the interaction by indicating

whether or not the interaction was social (i.e., facilitating some social objective such as arranging

an activity, becoming better acquainted or interacting just for the sake of interacting).

Participants also reported the location of this interaction (1 item; 1 = at home, 2 = someone else's

home, 3 = work/school, 4 = public space, 5 = others). The fourth and fifth questions concerned

the presence of others (1 item; 1 = yes, 2 = no) in this interaction, and whether participants were

engaged in other activities during the interaction (1 item; 1 = yes, 2 = no). Finally, participants

were asked to evaluate interaction quality on a four-item semantic differential scale of 1 to 5 the

extent to which the interaction was boring/interesting, dissatisfying/satisfying, distant/intimate,

and unpleasant/pleasant. Higher numbers indicated more interesting, more satisfying, more

intimate or more pleasant. The internal consistency of the four items using Cronbach's alpha was

satisfactory (alpha = .81). Therefore, a mean index (M = 3.89, SD = .04) was created for

interaction quality by collapsing the four items. The mean interaction quality in this sample

indicated that, overall, these voluntary social interactions were perceived as high in quality.

Results

In order to verify the findings from Study 1 with a larger sample, the first research

question addressed in Study 1 (i.e., "What types of internet interaction were used for significant

voluntary social interactions?") was re-examined in Study 2. Participants who reported on

internet interactions were asked to specify the kind of online interaction it was. One hundred and

twenty-eight participants specified the type of internet use. Results revealed that 91 (71.1%) of

the specified internet interactions were conducted through email, and 37 (29%) were conducted

through Instant messenger.

Distribution of Media Use Within Social Circles

Our next set of research questions explored the relative use of the internet in participants'

social circles (*M* local social circle = 18.32, *SD* local social circle = 11.96; *M* distant social circle

= 18.45, *SD* distant social circle = 16.45; *M* close local social circle = 9.41, *SD* close local social

circle = 7.01; *M* close distant social circle = 8.50, *SD* close distant social circle = 7.54).

Question number four asked how many relationships participants reported sustaining only

through the internet. Results indicated that of the average of 34.77 people in their local and long

distant social circles combined, subjects communicated with an average of 2.65 through the

internet alone. Note that these relationships did not necessarily develop online, but are

maintained online.

The fifth and sixth questions asked about the relative amount of social circles sustained,

at least in part, through each medium and how this was affected by the geographical distance or

perceived closeness of relationships. Table 2 summarizes the mean percentages of each social

circle communicated with using the internet, face-to-face communication, the telephone, and

mail. The social circles were the local and the long distance and, within each of these, the subset

of close relationships. That the rows do not total 100% demonstrates that single relationships are

often maintained through multiple media, creating overlap in the columns.

Insert Table 2 Here

These patterns of interpersonal media use depend heavily on geographical location and, to a lesser extent, on the closeness of the relationship. Local relationships were considerably more likely to be maintained face-to-face (73.49%) in comparison to the telephone (49.32%), internet (35.07%), or mail (5.6%). Long distance relationships were equally likely to be maintained using the telephone (49.61%) and the internet (48.99%), and slightly less likely to use face-to-face communication (41.55%). Mail was used more in long distance relationships than local ones, but in a relatively small subset of relationships overall. More intimate relationships within the social circles were reported to use more face-to-face communication and telephone calls than the circle as a whole, but only negligibly more than internet and mail.

Question number seven examined correlations between students' estimated percentages of online interaction within their social circles and interaction using three other media (face-to-face, telephone, and mail). Four sets of correlation analyses were conducted between participants' estimated percentages of online interaction and estimated percentages of face-to-face conversations, telephone calls, and mail within their local social circle, distant social circle, close social circle and close distant social circle. Results indicated positive correlations between estimated percentages of online interaction with all three other media (see Table 3) in all four social circles. The strongest correlations were between telephone and internet use in the local social circle, especially the close local circle.

Insert Table 3 Here

Comparisons of Interactions Across Media

Our final set of research questions turns from the distribution of media use within social circles, to comparisons amongst specific social interactions, controlling for media type and relationship type. Interactions were compared in terms of their purpose, physical contexts, and perceived quality.

Question eight examined the purposes of online interactions in relation to face-to-face interactions and telephone conversations. Participants were asked whether or not they were pursuing social purposes. Cross Tabulations results indicated that interactions in all three media were predominantly social (internet: 85.4%; face-to-face: 79.3%; telephone: 78.9%).

Question number nine examined the contexts of online interaction and those conducted face-to-face and on the telephone. These contextual variables included: 1) location of the interaction, 2) the geographical location (local versus long distance nature of the interaction), 3) engagement in other activities during the interaction, and 4) presence of another person during the interaction.

Location of interaction and media use. As indicated by cross tabulations (see Table 4), the majority of the reported face-to-face interactions (49.1%), phone calls (75.2%), and online interactions (73.5%) were conducted at home. Compared with face-to-face and online interactions, telephone calls were least likely to occur at work or school. Results also indicated that online interaction was less frequently conducted in public places than telephone calls and face-to-face interaction. In addition, face-to-face interaction was more likely to happen at someone else's home than telephone calls and online interaction.

Insert Table 4

Local versus long distance interaction and media use. These data were also examined for

the distribution of telephone and internet use in local versus long distance social interaction.

Since face-to-face conversations are necessarily local, they are not included in these analyses.

Online interactions were more likely to be long distance (65.6%) than local (34.4%). In contrast,

telephone conversations were more likely to be local (57.3%) than long distance (42.7%). A

series of 2 x 2 Chi Square tests of significance indicated that long distance internet interactions

were reported significantly more than local internet interactions (χ^2 (1) = 15.96, N = 163, $p <$

.001), and long distance phone calls (χ^2 (1) = 9.20, N = 174, $p <$ .01). In addition, local phone

calls were reported significantly more than local internet interactions, χ^2 (1) = 7.92, N = 146, $p <$

.01. Long distance and local telephone calls did not differ significantly from one another.

Presence of other individual(s) during the interaction and media use. We compared the

mean percentage of conversations in which people other than the interaction partner were present

across media. Results indicated that 26.5% of online interaction was conducted in the presence of

other people and 73.5% of the reported online interactions were conducted without others there

(see Table 5). Telephone calls were more likely to be conducted alone than not, but by a

considerably lesser margin than the internet.

Insert Table 5 Here

Number of activities during the interaction and media use. Cross Tabulation results indicated that the majority of the participants reported that they were engaged in other activities while communicating, across media. Multitasking was reported on the phone (61.2%), on the internet (63.9%), and most often, face-to-face (73.9%).

Interaction quality across media. Finally, question 10 examined whether the perceived quality of interactions varied depending on media use, relationship type, and purposes. A 3 (medium type) x 2 (social and nonsocial) x 4 (relationship type) analysis of variance was conducted. Results indicated a significant media type main effect, $F(2, 464) = 6.67$, $\eta^2 = .03$, $p = .00$, a relationship type main effect, $F(3, 464) = 22.55$, $\eta^2 = .13$, $p = .00$, and a social/nonsocial main effect, $F(1, 464) = 15.03$, $\eta^2 = .03$, $p = .00$. There were no significant interaction effects.

Fisher's LSD post hoc analyses of the medium type main effect revealed that face-to-face ($M = 3.94$, $SD = .79$) and telephone ($M = 3.99$, $SD = .78$) interactions were perceived as equal in quality, and as higher in quality than internet interactions ($M = 3.75$, $SD = .83$). Tukey's HSD post hoc analyses of the relationship type main effect indicated that interactions between acquaintances were perceived as lower quality ($M = 3.37$, $SD = .79$) than interactions in the other three relationship types, which were perceived to be of equal quality (Friends: $M = 4.07$, $SD = .68$; Romantic partners: $M = 4.01$, $SD = .80$; Family members: $M = 4.11$, $SD = .71$). The social/nonsocial main effect indicated that interactions facilitating social goals were perceived as higher quality ($M = 3.97$, $SD = .77$) than those, which were not social in purpose ($M = 3.56$, $SD = .86$).

Discussion

Study 2 examined the distribution of internet media use across different kinds of online media, the distribution of internet use in comparison to the use of face-to-face conversations and telephone calls, and compared interactions across media. The findings from Study 1 that email was the main internet medium for social interaction was further supported by this study. Given the absence of "chat" in study 2, it is possible that the reports of "chat" in Study 1 were in fact instances of instant messaging. The predominance of email supports Pew (2002) which found that 62% of college students used email as their main form of online social communication, making it by far the most common. Like Pew (2002), we also found that chat rooms, message boards, and newsgroups were not serving as venues for meaningful social interaction in this population. In contrast to those forums, email was particularly likely to be used with those one knows through other media, so this finding supports a view of online social interaction as part and parcel of multimedia relationships rather than a measurably distinct realm. The connections between online and offline social life are further buttressed by the finding that the average student reported only 2 or 3 internet-only relationships, which may well have been established face-to-face.

The view that users make active choices about media use, shaping their experience of the technology, is supported by our findings regarding distance and intimacy. Local relationships were most likely to use face-to-face conversation and least likely to use the internet. In long distant relationships, the internet was used in nearly as many relationships as the telephone, and more than face-to-face conversation. People were more likely to use face-to-face conversations and telephone calls in more intimate relationships. The internet did not get that boost from closeness, suggesting that although these students do use the internet in close relationships, being

close may not "call for" internet use in the same way intimacy has come to require face-to-face contact or telephone calls. Our findings also support the claim that those who use the internet the most are more sociable to begin with. The more students reported using the internet to maintain their social relationships, the more likely they were to use face-to-face conversations, telephone calls, and mail. Together, this set of findings support Dimmick et al's (2001) contention that the internet fills a unique niche shaped by geography, relationship and sociability. However, our findings also demonstrate that internet use is by no means restricted to that niche, and is used in many local and intimate relationships.

Finally, Study 2 compared specific interactions, controlling for medium and relationship type. Differences did emerge regarding purposes, contexts and quality. The internet has often been argued to be far better for the accomplishment of tasks than social interaction. However, the internet interactions were slightly more likely than face-to-face conversations and telephone calls to be identified as social. Furthermore, there was no interaction effect between social purposes and perceived quality, indicating that the quality of an online interaction does not diminish when the interaction's goals are purely social or increase when the goals are not.

In terms of contexts, the home emerged as the place of internet use, but also as the place of telephone calls and face-to-face conversations. The biggest difference was that face-to-face conversations were least likely to be held at home. Internet interactions were unlikely to be conducted in public, but were more likely than phone calls at work or school, when email can be more discreet than the telephone. These differences seem to reflect ease of access to technologies and environmental norms about their use.

Our findings about physical proximity in interactions complements our findings regarding the use of each medium within relationships in social circles, and further support the

idea that the internet is particularly useful in maintaining long distance relationships. Most local interactions that were not face-to-face were conducted on the telephone rather than the internet. Long distance interactions were more likely to use the internet than the telephone. Internet interactions were more likely to be long distance than local. Our findings do suggest that internet use is a solitary activity, in the sense that internet interactions were most likely to be conducted alone. However, given how few relationships were reported as maintained only online, these interactions were most likely moments in ongoing relationships that cross media. Rather than isolating contrasts to face-to-face or telephone relationships, these internet social interactions are better understood as occurring within the context of these multimedia social relations. Finally, though online interactions have been seen as "multi-tasking" (Pew Internet Project, 2002), and therefore perhaps less meaningful or rich, our data show that face-to-face conversations are even more likely to be conducted while engaged in other activities.

Internet interactions were evaluated as slightly lower quality than face-to-face conversations and telephone calls. However, the average quality of an online interaction was rated approximately one fifth of a point on a five-point scale lower than telephone calls and face-to-face conversations. The proportion of variance in conversation quality accounted for by medium was 3% (in contrast, the proportion accounted for by relationship type was 13%). On average, internet interactions were perceived as high in quality. Though there may be cumulative effects of this marginal loss of quality that this study did not allow us to examine, our findings offer no reasons to believe that internet communication is harmful for relationships or the people who have them.

<div align="center">Conclusion</div>

These studies examined social internet use by American college students. This population

has integrated the internet into many aspects of their daily lives and may well represent where

many other populations will eventually find themselves. However, we do not mean to suggest

that these findings can or should be generalized beyond this population. College students are

often living in group situations where access to face-to-face communication is high and

incentives for local online social relating may be low. Social interaction may mean more during

college life than many other phases of the life span. Given our argument that people will

incorporate the internet into their social lives in ways that fulfill their particular social needs, we

would expect that other populations would differ in the conditions under, and extent to which,

they used the internet socially rather than other media. Older populations, for instance, who

encountered the internet later in life may not find it nearly equal in quality to other modes of

interacting. Those working full time may use it more locally. Future studies should explore more

diverse populations for comparative analysis. Future studies would also benefit from richer

measures of interactions than those we used here. Finally, we caution that our findings do not

speak to the consequences of non-social uses of the internet. However, our findings do suggest

that the temptation to assume that the internet has strong effects may be misguided, particularly

if that assumption is made without contextual understanding of the users or other ways those

users pursue similar ends.

We began by questioning Nie et al's (2002) claim that the internet provides a tradeoff

between quantity and quality of interaction. Our results suggest that the quantity of interactions

in other media does not seem threatened by social internet use. Face-to-face communication was

by far the most common mode of local interaction, and was only slightly less common in long

distance relationships than the internet. Furthermore, the more people students communicated

with using the internet, the more they communicated with face-to-face and on the telephone. The quality of online interactions was lower than that of face-to-face conversations, but only by the slimmest of margins. Our findings also demonstrate that face-to-face conversation may not always be that rich, deep, and inherently superior means of communication it is often presumed to be. The quality of face-to-face conversation was rated no higher than telephone calls (in fact, the mean quality of telephone calls was higher, though not significantly so). People having face-to-face conversations were most likely to be engaged in other activities simultaneously. In sum, our studies suggest that instead of a tradeoff between wonderful face-to-face conversations and lower quality internet interactions, students are supplementing wonderful face-to-face conversations and telephone calls with really good internet interactions. The grounds for worrying about this phenomenon seem shaky at best.

When a technology grabs hold and diffuses as rapidly as the internet, it is reasonable to be concerned about its impact. However, understanding these impacts requires demystifying the internet. Rather than studying "The Internet," we need to differentiate amongst multiple aspects of this complex and pervasive technology and to clearly distinguish the internet from other strategies for accomplishing the same cultural goals. We need to understand that users may be influenced by the technologies' affordances, but they also appropriate technologies to serve their needs. We need to explore different populations of users as well as different kinds of internet uses. Before we have built a strong foundation of such studies, any pronouncements about the internet's dangers or salvations should be treated with skepticism.

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Table 1: *Number of Media Used*

Media Used	N
Only Face-to-face	1
Only Telephone	0
Only Internet	1
Face-to-face and Telephone	12
Face-to-face and Internet	4
Telephone and Internet	1
Face-to-face, Telephone, and Internet	32
Total	51

Table 2.

Mean Percentage of Interaction: Social Circle by Medium Type

	Face-to-face	Telephone	Internet	Mail
Local Social Circle	73.49	49.32	35.07	5.70
Distant Social Circle	41.55	49.61	48.99	13.94
Close Local Social Circle	79.33	57.15	35.66	6.74
Close Distant Social Circle	50.23	56.57	49.77	15.90

Note: single relationships are often maintained through multiple media, creating overlap in the

columns. Therefore, rows do not total 100%.

Table 3

Correlation Between Online Interaction and Interaction Using the Other Three Media

	Local Social Circle		
	Face-to-face	Telephone	Mail
Online Interaction	.19**	.48**	.27**
	Distant Social Circle		
Online Interaction	.16**	.19**	.16**
	Close Local Social Circle		
Online Interaction	.26**	.56**	.33*
	Close Distant Social Circle		
Online Interaction	.27**	.34**	.29**

** $p < .001$.

Table 4

Location of Interaction and Media Use

Location	Media Type			
	Face-to-face	Telephone	Internet	Total
Home	81	124	122	327
Someone's home	18	5	4	27
Work/School	30	12	26	68
Public Place	19	11	3	33
Other	17	13	11	41
Total	165	165	166	496

Table 5

Presence of Other People During Interaction and Media Use

Presence	Media Type			
	Face-to-face	Telephone	Internet	Total
	(n)	(n)	(n)	(N)
With	93	69	44	206
Without	72	96	122	290
Total	165	165	166	496