The Quality of Online Social Relationships

Online relationships are less valuable than offline ones. Indeed, their net benefit depends on whether they supplement or substitute for offline social relationships.

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People use the Internet intensely for interpersonal communication, sending and receiving email, contacting friends and family via instant messaging services, visiting chat rooms, or subscribing to distribution lists, among other activities. The evidence is clear that interpersonal communication is an important use of the Internet, if not its *most* important use. For example, both self-report surveys [12] and computer monitoring studies [5] indicate that email is the most popular online application.

Claims regarding the Internet's usefulness for developing social relationships, however, remain controversial. Both personal testimonials (for example, [10]) and systematically collected data document the deep and meaningful social relationships people can cultivate online (for example, [8]).

This evidence, however, conflicts with data comparing the value that people place on their online relationships with offline relationships and with data comparing social relationships among heavy and light Internet users. For example, Parks and Roberts [9] surveyed users of multiplayer environments called MOOs. Ninety-three percent of the users had made friends online, but when asked to compare their online friendships with those offline, respondents rated offline ones higher. Respondents to Nie's [7] national survey reported spending less time with friends and family since going online, with the decline greatest among the most frequent Internet users. And Kraut et al. [6] presented longitudinal evidence to demonstrate that among new Internet users, online time diminished social involvement and psychological well being.

Understanding the impact of the Internet on human social relationships requires two types of evidence. First, we need to know how computer-mediated communication affects the quality of particular social interactions and relationships. Are the online ones better, the same, or worse than those sustained by other means? Second, we need to know how computer-mediated communication affects one's mix of social interactions and relationships. The impact of the Internet is likely to be very different if it supplements communication with existing friends and family, or if instead it substitutes for more traditional communication and social ties.

This article addresses the first question by explicitly comparing online and offline social interaction. We briefly summarize evidence from several empirical studies, all of which suggest that computer-mediated communication, and in particular email, is less valuable for building and sustaining close social relation-

ships than face-to-face contact and telephone conversations. These studies include the following surveys:

- International bank employees who describe the value of particular communication sessions for work relationships;
- College students, using the same methodology, but focusing on personal relationships;
- A longitudinal study of new Internet users; and
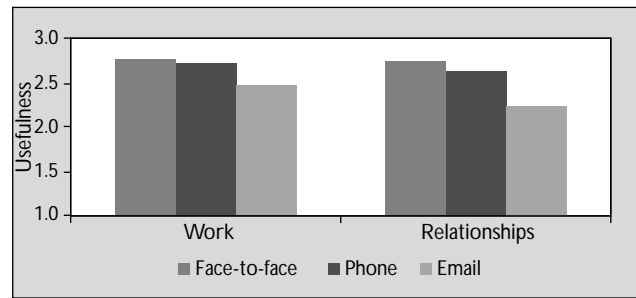- Examination of behavior on email-based listservs.

Comparing Communication Over Different Media

One way to evaluate the usefulness of the Internet for developing and maintaining social ties is to ask people to compare particular communication sessions on relevant outcomes. One can then relate the outcomes to features of the communication session (for example, who it was with, the duration, and the modality over which it occurred). This technique has been used to uncover features of conversation that lead to the development of social relationships in face-to-face settings (for example, [3]). We apply it to email, telephone, and face-to-face communication among bank employees and university students.

In our 1991 study, 979 employees of a multinational bank reported on their most recent communication conducted over different media. About 81% used email in their jobs, sending an average of 15 messages per week. Respondents evaluated the usefulness of communication episodes using criteria related to the success of work groups, including usefulness for getting work done and for developing or sustaining a work relationship, utilizing a 3-point scale, where 1 meant not very useful and 3 meant very useful. We report data on 5,205 communication episodes that occurred in person, by telephone, or by email (see [4] for more detail.)

Figure 1 compares the evaluation of conversations held over each media for the two measures of success. Respondents reported communication by email to be reliably worse than communication conducted face-to-face or by telephone, both for getting work done and for sustaining work relationships. However, the disadvantages of email were significantly greater for maintaining relationships than for getting work done. These differences among the media remain even when one statistically controls for relevant variables, including respondents' gender, age, job title, daily volume of communication, and experience with email.

One might object that this data comes from the early years of email, although employees in this firm had been using email since the mid-1970s. In addition, one might also object that personal relationships are not central to work activity, although many studies stress their importance for getting work done. To counter these objections, we replicated the original study in 1999 among students at an eastern university. These stu-

Figure 1. Perceived usefulness of communication by media and outcomes in an international bank.

Figure 2. Perceived usefulness of communication by media and outcome among college students.
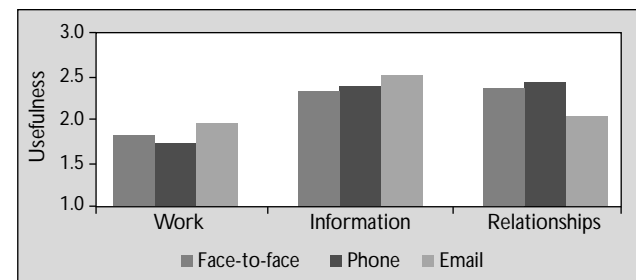
dents used email extensively, estimating a mean of 11 messages per day, and were in a stage in life that stressed the importance of developing personal relationships. Some 39 students completed a diary, recording information about each of 259 communication episodes in which they had participated during a four-hour block—late afternoon to early evening. Students recorded their relationship with their communication partner (relative, friend, acquaintance, or other), its duration, the topic of conversation (schoolwork, personal, or other), and the modality over which it occurred. Respondents evaluated each communication for its usefulness in getting work done, exchanging information, and developing or maintaining a personal relationship. They made their evaluations on 5-point scale.

Like the banking study, students evaluated email communication sessions as an inferior means to maintaining personal relationships compared to those conducted in person (p <0.05) and by telephone (p < 0.05), these latter being equal (see Figure 2). The students, however, found email to be as good as the telephone and in-person communication for completing

schoolwork (p > 0.10), and even better for the exchange of information (p < 0.05).

Students also estimated the frequency of communication over the different modalities and the strength of their relationship with each of the 148 partners. We created an index of relationship strength by averaging their answers to two questions: "How close do you feel to this person?" and "How often do you get favors or advice from this person "(alpha = 0.92). We used linear regression to predict the strength of the relationship from frequency of communication with that partner over the different modalities: email, in-person, and telephone. Frequency of communication across all three modalities was significantly related to the strength of relationship, both directly and once the partner's gender, nature of the relations, length of the relationship, and geographic distance between the parties were controlled statistically. However, commu-
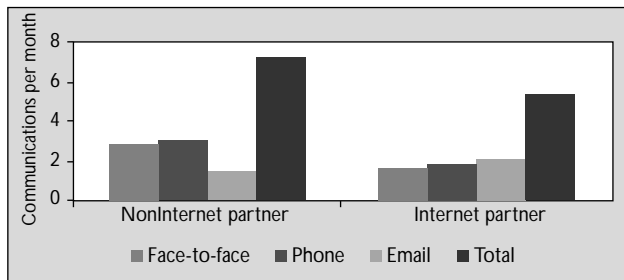

Figure 3. Frequency of communication per month by modality and partner type.

nicating in person (Beta s= 0.36) and by telephone (Beta = 0.27) were both significantly better predictors of a strong relationship than was communication by email (Beta = 0.15).

Comparing Internet Versus NonInternet Social Partners

In these studies, respondents selected communication episodes and partners based on the recency of the communication session. This procedure has the advantage of sampling all potential conversations, but may over-represent social relationships not important to the respondents, but are frequent simply because the partners are nearby. Here, we compare the value of using computer-mediated and noncomputer-mediated communication to keep up with partners with whom the respondents have a substantial amount of communication. The data comes from the HomeNet project, a field trial that tracked Internet usage and communication behavior among a sample of 93 households in Pittsburgh during their first year or two online (see [5]).

Participants answered a series of questions about two individuals with whom they had frequent com-

munication. The first, whom we refer to as the "Internet partner," was the individual outside of their household to whom they sent the most email, as recorded in computer-generated usage logs collected as part of the project. Some 111 respondents answered questions about an Internet partner. The second, whom we refer to as the "nonInternet partner," was the person outside of their household with whom respondents claimed to have the most frequent communication in any modality. Some 125 respondents answered questions about a nonInternet partner. To allow for comparisons between relationships conducted by email and those conducted primarily over other modalities, we limit our analyses here to the 99 respondents who answered questions both about an Internet and a nonInternet partner, and for whom these partners were different individuals.

Respondents indicated each partner's gender and age, duration of acquaintance, role relation (for example, family, friend, co-worker), and geographic proximity (for example, neighborhood, city, state). Participants then rated their frequency of email, face-to-face, and telephone communication: (5-daily, 4-weekly, 3-monthly, 2-less often, 1-never). A 5-point scale indicated psychological closeness with the partner: "I feel very close," "I could freely confide in this person," "This person is important to me," and "I understand this person fully" (alpha = 0.90).

We were interested in three questions: Do people differ in the overall volume of communication they have with the people they keep up with using different modalities? Do they differ in how close they feel toward them? Is communication with a partner over different modalities predictive of differing degrees of psychological closeness?

The number of respondents' communication sessions per month, broken and summed over all modalities, indicate that participants communicated less frequently with their Internet partner (5.2 times/month) than their nonInternet partner (7.2 times/month, p < 0.001) as shown in Figure 3. Although respondents communicated more by email with their Internet partner (p < 0.001), they communicated less using the other modalities (p < 0.001 for face-to-face and p < 0.001 for telephone). Respondents also reported feeling less close to their Internet partner than to their nonInternet partner (p < 0.001).

Using a least squares regression analysis, we predicted psychological closeness from frequency of communication for the nonInternet partner and Internet partner, controlling for sex, age, role relation, duration of acquaintance, and physical proximity. Most notably, frequency of communication was a critical predictor of psychological closeness with the nonIn-
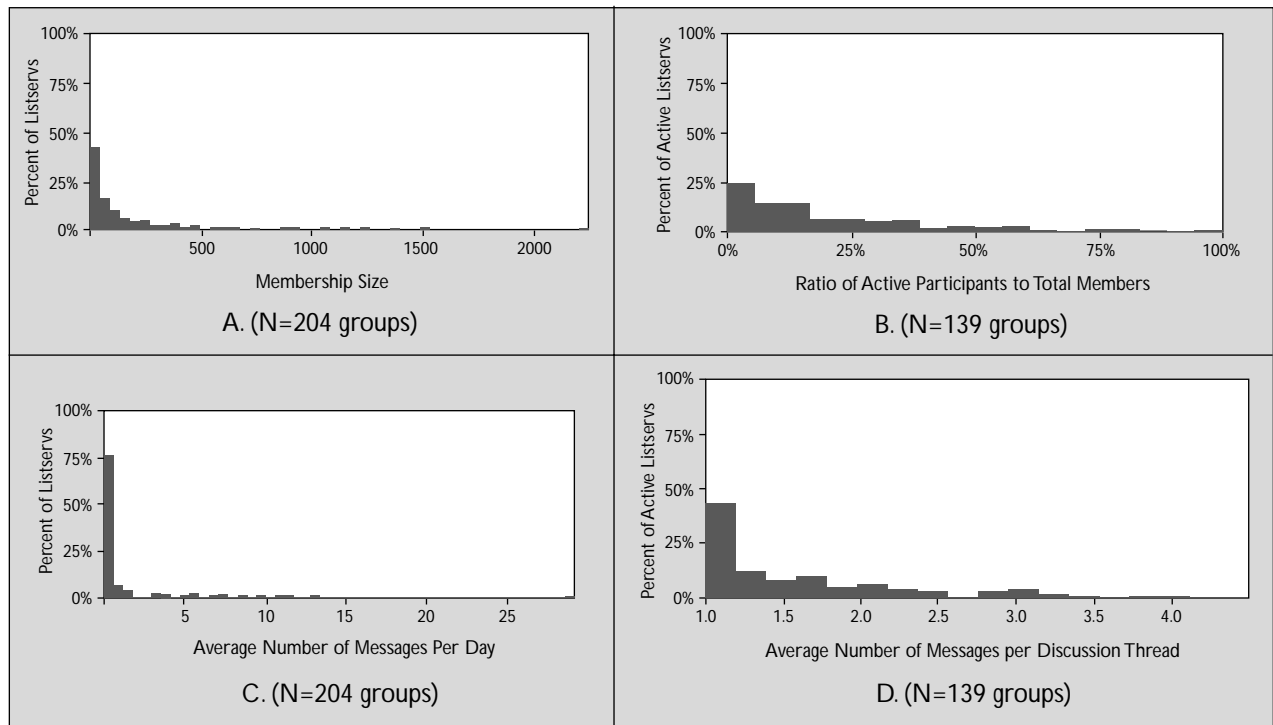
Figure 4. The distribution of listservs in membership, and participation ratio, message volume, and discussion length.

ternet partner (Beta = 0.40), but not with the Internet partner (Beta = -0.08). The difference is statistically significant (p < 0.001). The weaker association of communication with closeness for the Internet sample is analogous to findings from the student sample.

Social relationships offline involve more communication than those developed online, and thus predicted psychological closeness. Given our cross-sectional data, we cannot tell if communication does not lead to closeness when people are communicating electronically, or if people are exchanging email with people to whom they do not feel close. In either case, they are not getting as much social benefit from email as they do from their other communication activity.

Online Social Groups

The research we described so far concentrates on dyadic relationships between individuals in their online and offline lives. Yet one of the prominent features of the Internet is the presence of larger social collectives, which researchers have called "electronic groups" or "communities." Even before the advent of the Web, the Internet provided an infrastructure for online group-level social behavior, through USENET and email-based distribution lists. In descriptions of social life on the Internet,

these electronic or virtual communities are often described as groups where relationships form, and whose members provide each other with companionship, information, and social support [11].

While existing studies and stories of electronic groups provide insight into the types of social activity that can occur in electronic collectives, the anecdotal nature of this research leaves open the question of what typically happens. Are active, tightly knit electronic groups, in which people form personal relationships and develop a sense of belonging, the norm or are the cases reported in the literature interesting exceptions? To examine this question, we collected data from a sample of 204 Internet listservs. The data shows that, on average, listservs are much more like loosely knit, voluntary organizations than the tightly knit social communities highlighted in prior case studies.

The sample consisted of 204 unmanaged and unmoderated email-based listservs, drawn from a population of approximately 70,000 listservs. An initial random sample of 1,066 was stratified by topic type (work-related, personal, and mixed) to ensure it included a range of topics and member populations. Listservs were dropped from the initial sample if the list owner declined to participate in the study (21%); the listserv was defunct (16%); it had closed membership, generally as part of an organization, course, or task force (15%); or it could not provide membership data in an automated fashion. The final sample consisted of lists evenly divided among those oriented

around professional, personal, and academic topics. Based on descriptions of the lists, we were able to classify them as purely electronic or as hybrid, combining both electronic and traditional communications, especially conventional face-to-face meetings. For example, a national list for youth hockey was judged as purely electronic, while the mailing list for a city-specific country dancers' group was judged as hybrid (see [2]).

For a 130-day period we collected data on each listserv's membership and communication activity. During the observation period, membership was characterized in terms of size (number of members), growth (members entering as a percentage of initial size), loss (members leaving as a percentage of initial size), and net change in size (as a percentage of initial size). Communication activity was measured in terms of volume (number of messages per day) and interactivity (length of discussion threads). In addition, measures of member participation (percentage of members contributing messages and the concentration of message contributions among the active participants) were created for each listserv. The table appearing here delineates this information, and contrasts the purely electronic with the hybrid lists. Figures 4a–d, respectively, show the distribution of the number of subscribers, the proportion of all subscribers who posted a least one message during the 130-day observation period, the daily number of messages per listserv, and the average number of messages per discussion thread.

Unlike traditional small groups, listervs have large, fluctuating memberships in which a small core of active participants generates relatively low levels of sporadic communication, whose messages rarely receive a response. Small groups, as described in the social psychological research literature, have between 3 and 15 members, with relatively low turnover. By comparison, the listservs were much larger (median of 64 members), with high churn (22% of original members dropping out annually and double this number joining). In contrast to highly interactive conversation involving almost all group members (typical of small groups), listservs exhibit little communication, with a full 33% exhibiting no communication during the 130-day observation period. Of those that did, the median listerv accrued 0.28 mes-

Variable	Measure	Mean Overall	Median Overall	Median Pure Electronic Lists	Median Hybrid Lists	Different Pure vs. Hybrid
Size	Number of members at start of observation period	163	64	91	34	***
Growth	Member entering during 130 day observation period as percentage of initial size	23%	15%	14.8	16.7	
Loss	Members leaving during 130 day observation period as percentage of initial size	13%	8%	8.1%	8.1%	
Change	Net change in size as percentage of initial size	9%	4%	4%	2%	
Volume[A]	Average number of messages per day	1.650	0.28	0.24	0.38	
Interactivity	Average discussion thread length. Thread length of 1 indicates the originating message	1.580	1.33	1.61	1.50	
Member Participation	Percentage of members who contributed messages during the observation period	22%	15%	15%	19%	

N = 204 listservs
*** p< 0.001
[A] 33% of the sampled groups had no activity during the observation period. The reported data is from the active groups.

sages per day (or less than 0.0004 messages per subscriber per day). Over 50% of members contributed no messages over the 130-day observation period, and a small number generated most of the messages. Conversation was not interactive. On average, fewer than one message out of three received any response.

Population characteristics for Internet listservs.

The hybrid groups differed little from the purely electronic groups. Though they were significantly smaller, probably reflecting the more limited geographic area from which they could attract members, both types of groups had similar high turnover, low volume of messages, low level of interactivity, and domination by a small proportion of their membership. Regardless of how the hybrid groups acted when they met face-to-face, online they acted like typical weak-tie collectives.

In terms of membership size and change, communication volume and structure, and participation levels, Internet listservs do not appear to be intimate social groups. These findings highlight a bias in prior research on online social activity. While the goal of describing the existence of true social behaviors in online environments has been well served by focusing on highly active and interactive examples of electronic collectives, these cases are not representative of what typically happens. For example, interactivity is a common theme in many descriptions of online social activity (for example, [1]). However, our results imply that while interactivity can occur in these contexts, it is the exception, not the rule, when it occurs.

It was not the case that all listservs in this sample had impoverished social behavior, although this was

the norm. Nor is it necessarily the case that all types of electronic collectives will look like listservs in terms of the quality of their social behavior. MUDs, MOOs, and Internet Relay Chat are highly interactive, at least among those who actively participate. As is the case with asynchronous media, however, research studying these phenomena has focused on interesting cases (that is, active ones). As a result, we know little about typical behavior in synchronic electronic collectives.

Clearly, there are cases of both synchronous and asynchronous electronic collectives that support the formation of substantial personal relationships and the development of group identity. On the other hand, these types of social activities seem unlikely to occur regularly in the typical listserv, where turnover is high and communication activities is low, noninteractive, and the result of contributions by a small percentage of the membership. This suggests that social places on the Internet where close personal relationships are formed and maintained are rare.

Conclusion

Using the Internet to build social relationships results in social interaction that is wanting, at least when it is explicitly compared to the standards of face-to-face and telephone communication, to social relationships that are primarily conducted offline, and to traditional small groups. We do not assert that online social interaction has little value. Surveys of the general public continually reveal that most people using the Internet value email and other forms of online social interaction. Even in the age of the Web and e-commerce, online social interaction is still the most important use of the Internet [5]. However, in one-to-one comparisons, an email message is not as useful as a phone call or a face-to-face meeting for developing and sustaining social relationships. Listservs are not as valuable as small groups for establishing a sense of identity and belonging and for gaining social support. Relationships sustained primarily over the Internet are not as close as those sustained by other means.

Should these observations be a source of concern? To answer this question, we need additional information not yet available. Our data suggests the Internet is less effective than other means of forming and sustaining strong social relationships. The consequences of using the Internet for social relations, however, depend not only on the quality of the relationships sustained using it, but on opportunity costs as well. Do less-effective email messages substitute for or supplement telephone conversations and personal visits? Do weak social relationships formed online add to one's total stock of social relations or substitute for a more valuable partner? Does the time people spend reading listservs and participating in MUDs add to their social interaction, or substitute for time they would have spent in real-world groups? Only by examining people's full set of social behavior and examining their full inventory of social ties can we assess the net social impact of online social relationships. **C**

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