

Social Impact of the Internet: What Does It Mean?

Using the Internet at home causes small but reliable declines in social and psychological well-being, according to our findings after conducting one of the first prospective studies examining the domestication of the Internet—the integration of the Internet into the home (see R. Kraut et al. “Internet Paradox: A Social Technology that Reduces Social Involvement and Psychological Well-Being,” *Amer. Psych.*, Sept. 1998). Because this research is controversial, we offer some comments to help readers understand the results and decide how they might respond to them as consumers and as technology developers.

The HomeNet project (see homenet.hcii.cs.cmu.edu/progress/research.html for the full report and more), studied a sample of 169 people in Pittsburgh during their first year or two online. As people in this sample used the Internet more, they reported keeping up with fewer friends, spending less time talking with their families, experiencing more daily life stressors, and feeling more lonely and depressed. These results occurred even though interpersonal communication was their most important reason for using the Internet.

If accurate, the results are troubling. These effects were not large, but they contradict many popular beliefs about the Internet, and they were a surprise. Should they lead us to reconsider how to use the Internet or what Internet services to offer? The remainder of this column addresses important issues.

- *Are the conclusions true for the HomeNet sample?* Several critiques have mistakenly concluded that because the HomeNet trial did not include a separate control group, other events occurring during the period of the HomeNet trial—the economy, poor weather, or even the failure of the Pittsburgh Steelers to reach the Super Bowl—could account for declines in well-being. The confusion arises because our study was not a “true experiment,” in which randomly assigned participants were either allowed or prevented from using the Internet. In the HomeNet trial, all subjects were given Internet access, and we compared heavier users with those who used it

lightly or not at all, after statistically matching them on gender, age, race, social class, and initial levels of well-being. Our results show larger declines in well-being for those who used the Internet more heavily. Changes in the economy, for example, cannot account for our results, because these changes should equally influence both heavy and light users.

- *Is it causation?* Even though a correlation between variables is a prerequisite for concluding that they are causally related, it is not a sufficient condition. Measuring at multiple times, however, does allow us to make a causal claim from correlational data. The HomeNet research monitored a panel of families over time. Social and psychological well-being measured before they gained home access to the Internet did not predict how much they subsequently used it. In contrast, their hours of Internet use did predict subsequent declines in their psychological and social well-being.

- *Are the HomeNet conclusions valid for any group other than the one studied?*

Some critics have dismissed our conclusions because they are not drawn from a national sample of the U.S. population. Many important studies in medicine and the social sciences have examined small community samples, and in doing so, have traded off the depth achieved in examining a small sample over time with the generality achieved in large, national surveys. To understand the impact of home Internet use, our group believed we needed to follow the same participants over time and to observe their actual use of the Internet, rather than rely on their inaccurate estimates.

Our team acknowledges that one must be careful in generalizing conclusions to groups we did not study. For example, our sample included few single-person households, few people between ages 22 and 40, few disabled people, and no people from rural populations. The impact of using the Internet may very well be different for these groups. In addition, the impact is likely to be different for people with few other options for social

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contact. We do believe, however, that our results will generalize to groups similar to those studied—normal teenagers and adults living with their families in an urban area, coming from a wide range of racial, educational, and income levels, and experiencing their first year or two online.

- *How important are the declines in psychological and social well-being from using the Net?* As we noted, on average, the Internet had a small, negative impact on well-being. For example, a white, teenage boy in the group with the lowest half of Internet use would experience a symptom of depression, on the average, 1.2 days per week. A boy who initially had a similar frequency of symptoms but was among the top half of Internet users might experience a symptom of depression an average 1.4 days per week, a 17% increase. We do not make much of the size of these effects for two reasons. First, when one visually examines plots that relate Internet usage with measures of well-being, it is clear there is a large amount of variation around the average trends. Second, people have trouble remembering and reporting symptoms they experience, time spent communicating, and other outcomes. The surprise to us is that the direction of the effect is opposite to what many in the Internet community, including ourselves, had predicted.
- *What should we do in response to these results?* We cannot seriously recommend change until we better understand why using the Internet leads to declines in psychological and social well-being. However, we do have two hypotheses. First, time spent online may take time away from more valuable activities, including social contact, sleep, or reading books. Second, it may be that the Internet activity itself is somehow to blame. For example, it is possible that many of the social relationships people maintain online are less substantial and sustaining than relationships that people have in their actual lives. Alternately, it may be that the current technology of computer-mediated communication is a less adequate medium for social communication than the telephone or face-to-face interactions it displaces.
- *Should people reduce their use of the Net at home?* Moderation in the use of the Internet, as in most activities, is sensible. But perhaps more importantly, people should pay attention to how they use the Internet and the cost of the time

devoted to the Internet. Compared to television, with its relatively small variety of programs, the range of Internet experiences is vast, giving us much more choice and control. Many online activities are valuable. But we should not be seduced into wasting time online just because it is easy to do.

- *Are there technology implications of this study?* The principal user-level services offered, including email, Web access, chat, and newsgroups, are legacies of days when the Internet was used primarily by technical and professional people in offices. We see many opportunities for improvement as the domestication of the Internet proceeds. For example, the buddy lists in AOL's Instant Messenger and ICQ and the protected Web sites in Hewlett-Packard's Message Board are innovations that may make connection more beneficial in the home. These are small steps, however, and we see this as a neglected research area that warrants attention from academia, industry, and government.

Opportunities for improvement also exist in networking and computing technology. For example, lower connection latencies, creating the appearance of a persistent network connection, may encourage people at home to use the Internet when needed and in shorter bursts (for example, to check movie listings) rather than encouraging them to linger to recoup the costs of connecting. Computing can also be made more social in the home. There are researchers experimenting with multiple keyboards, for example, that might help convert a PC into a more group-oriented machine.

The evolution of the Internet and the domestication process is only just starting. Perhaps the principal lesson of our study is that we must expend the effort to understand actual usage experience and evaluate social impacts, and to use this understanding to make better informed design decisions. **C**

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