

The connection between online communication and psychological well-being depends on whom you are communicating with.

BY ROBERT KRAUT AND MOIRA BURKE

Internet Use and Psychological Well-Being: Effects of Activity and Audience

PEOPLE AROUND THE world have incorporated the Internet into their daily lives, using it to find information, communicate with friends and family, shop, play games, and pass the time. How does it affect our well-being?

The media frequently posit the Internet is changing our social lives, warning of a “Sad, Lonely World Discovered in Cyberspace”¹³ or asking “Is Facebook Making Us Lonely?”¹⁶ Even Pope Benedict warned that “virtual contact cannot and must not take the place of direct human contact.”¹⁹ A major reason for this fascination with new technologies and social relationships is that these relationships have important consequences for both physical and psychological health (for recent reviews, see Callaghan⁸ and Thoits³¹).

These concerns have been reflected in the scholarly literature as well. For example, prior research suggests



Internet use influences the amount of interpersonal communication people engage in, the partners with whom

» key insights

- Talking with close friends online is linked to improvements in social support, depression, and other measures of well-being, but talking with strangers and reading about acquaintances are not.
- Readers should be skeptical of cross-sectional and survey-based studies linking well-being to Internet use.
- Instead, experiments or longitudinal designs pairing surveys with log data provide more reliable insights.
- Human agency is key: The effect of technology on our lives depends on how we use it, what we talk about, and whom we talk to.



they communicate, and the quality of the communication episodes in which they participate (for example, Cummings⁹). Much research shows people communicate online primarily with people with whom they communicate offline—their relatively strong social ties—and their online communication supplements rather than replaces their offline communication.^{10,20} For example, in early research, Bikman and Eveland³ and Hampton and Wellman¹² showed how everyday use of computer networks increased peoples' recognition of those they communicated with online. If so, one would expect that increased use of the Internet, especially for communication with strong ties, would increase

the amount of social support people have available to them and thereby improve the downstream consequences associated with social support, for example, by reducing depression, stress, and loneliness, and improving mood and even physical health.^{21,28}

However, other research suggests the quality of the communication people have online is impoverished and less valuable than time spent in spoken communication, either face-to-face or by phone (for example, Cummings⁹). Moreover, the relatively low cost of online communication and its insensitivity to distance may encourage people to differentially increase their communication with weak ties or strangers.²⁹

Communication with weak ties and strangers is unlikely to have the same psychological benefits as communication with stronger ties. While it is possible for friendships initiated online to develop into close relationships over time,^{17,13} the preponderance of ties in our online social networks are acquaintances and other weak ties.²⁹ If substitution is occurring, with communication with weak ties crowding out communication with stronger ones, increased use of the Internet could potentially decrease the social support people have available and harm their psychological well-being.

Our research over the past 15 years has attempted to determine how every-

day use of the Internet influences users' psychological well-being.

A Methodological Critique

The answers to questions about the impact of Internet use on well-being are unclear for two reasons. First, while questions about causation and change demand longitudinal or experimental data,²⁷ typical research in this area uses cross-sectional survey techniques. Cross-sectional analysis can produce misleading conclusions. For example, in one of our early studies with the Pew Internet and American Life Project, cross-sectional results showed Internet communication with a particular other person was strongly associated with phone and face-to-face communication with that person. In contrast, longitudinal analyses of the same data showed greater Internet use during a time period was associated with declines in in-person visits to the partner.²⁵ One reason that conclusions from cross-sectional analyses should not be trusted is they confound predispositions for using technology with its

effects.²⁶ When trying to understand the causal connection between Internet use and psychological well-being, the problem is initial well-being or relatively stable social characteristics, such as social competence or extraversion, can influence both how people use the Internet and their social and psychological well-being. For example, in longitudinal work, Mikami and colleagues demonstrated that adolescents' social competence and psychological health (for example, depression) predicted their online activities seven years later, including their online social network size and the number of their ties offering verbal social support.¹⁸ In the face of this evidence showing adolescents' depression predicts their adult Internet use, it is then difficult to argue using only cross-sectional studies that Internet use causes depression.

The second major problem is that much of the extant research fails to differentiate types of Internet use and use by different types of people, and thus fails to provide insight into the mechanisms at play. Early research simply

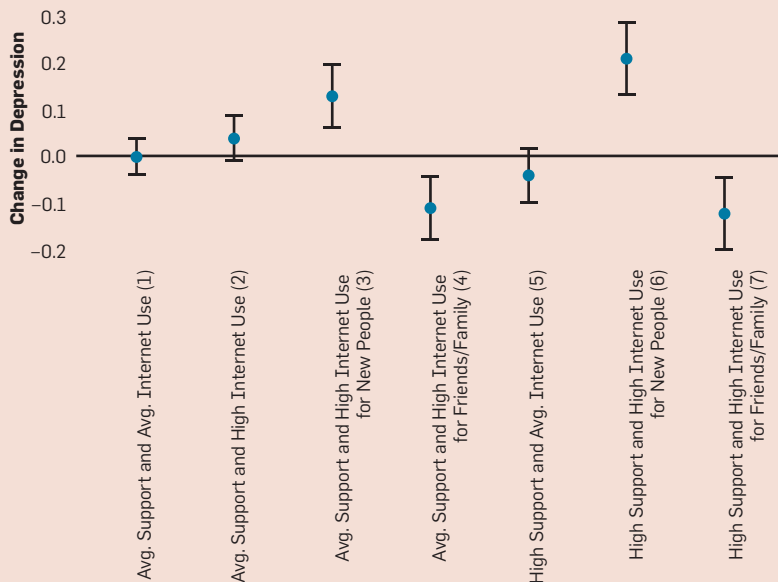
differentiated Internet users from non-users,¹⁴ and more recent research often examines the amount people use the Internet without comparing qualitatively different types of use.²⁸ Yet research that does differentiate types of use suggests that different uses of the Internet may have distinct associations with well-being for different kinds of people. For example, over a one-year period, depression increased among Dutch adolescents who used the Internet for Web surfing, but declined among those who used it for chatting with friends; moreover, these associations occurred only among adolescents who received little social support from their closest friends.²³ In another study, instant messaging use predicted increases in depression, but email use did not;³² the increase in depression may have been limited to instant messaging because it tends to be substantively shorter and more superficial than email.⁹ Burke and colleagues found that exchanging messages with one's Facebook ties was associated with increases in social capital while simply reading news about them was not; however, individuals with lower social communication skills seemed to benefit from both types of activities.⁶ Understanding the complicated relationship between Internet use and well-being requires an examination of the Internet's myriad forms and differences among users that both drive online activity and moderate its effects.

Differentiating Internet Uses in Longitudinal Research

Research from our lab over the past 15 years has attempted to overcome these challenges. It employs a common methodology, using lagged dependent variable linear regression on longitudinal data to examine how different uses of the Internet during a time interval predict changes from the beginning to the end of the interval in social and psychological outcomes such as social support, depression, and loneliness. This research is correlational and not as powerful as random assignment experiments in demonstrating the causal impact of an intervention, for example, Shaw.²⁴ However, random assignment is generally impractical if the goal is to identify the long-term impact of Internet use, because in developed

Figure 1. Relative changes in self-reported depression symptoms (CES-D) over a six-month period predicted by initial social support and types of Internet use.


Zero on the y-axis represents changes in depression among survey respondents with average levels of social support and Internet use. Each point shows the relative change in depression in standard deviation units and its standard error associated with having more initial social support and/or use of the Internet to communicate with friends and family or with new people. "High" means a standard deviation more than average of a predictor variable (adapted from Bessi re et al.¹).




countries where Internet use is already pervasive, few people would willingly agree to be randomly assigned to forgo Internet access use for long periods of time. A panel design mitigates many threats to making causal inferences from correlational data. By observing the same individuals multiple times, by knowing the temporal ordering of the intervention (Internet activities) and the outcomes (well-being), and by controlling for initial well-being, this research design minimizes the possibility that self-selection to the intervention and reverse causation account for associations between Internet use and changes in well-being.

Our first research on this topic was conducted in 1997, the dawn of the Internet era for most people who did not work in universities or research laboratories.¹⁵ In this research, families with high school-aged children were given computers and Internet access. Their email and Web use was monitored, and family members completed three surveys over one year period. Results indicated the more people used the Internet, independent of the way they used it, the more their depression increased and social support and other measures of psychological well-being declined. Although depressed people typically engage in less social contact than do less-depressed people,¹⁸ initial depression was statistically controlled in the analysis and Internet use was measured subsequent to the initial measures of depression; therefore variations in initial depression cannot account for these results. Moreover, this research tested for and found no evidence for reverse causation, where early measures of social support, depression, loneliness, or stress predicted subsequent Internet use.

Even though this research differentiated asocial Internet use (Web browsing) from social uses (online communication via email and participation in online groups), it did not differentiate communication with stronger or weaker ties. Indeed, during this early era, most participants' close ties were not yet online. Therefore, use of the Internet for any purpose, even highly social, interpersonal communication, may have presented an opportunity cost, shifting people's time and attention away from more fruitful offline com-



Understanding the complicated relationship between Internet use and well-being requires an examination of the Internet's myriad forms and differences among users that both drive online activity and moderate its effects.



munication with closer friends. Or, other changes in unmeasured factors, such as participants' satisfaction with their relationships, may have driven increases in both time spent online and depression.

We conducted a replication with a new sample, when a larger fraction of people's social networks were Internet users and when the Internet offered a wider variety of services.¹ In this research started in late 2000, 922 respondents from a national sample of U.S. households were contacted using random digit dialing. In three surveys spread over a year, respondents described on multi-item scales how frequently they used the Internet for different purposes: communicating with friends and family; communicating in online groups and to meet people; retrieving and using information; seeking entertainment or escape; shopping; and acquiring health information or talking about health. Confirmatory factor analyses demonstrated that differentiating these types of Internet use fit the data better than a model that assumed use reflected a single dimension ranging from light use to heavy use.

Figure 1 illustrates how Internet use was associated with changes in well-being. It shows changes in self-reported depression over a six-month period among people who initially had different levels of social resources available and who used the Internet for different purposes compared to people with an average amount of social support and of Internet use. The first point shows the change among people who initially had average levels of social support and who used the Internet an average amount across the different purposes; it has been normalized to zero for comparison purposes. Point 2 shows the more people used the Internet overall, the more their self-reported levels of depression increased compared to the base rate, although the increase was not statistically significant during the first six-month interval reported in Bessière¹ ($p < 0.10$). However, additional data collection in a six-month follow-up with the same respondents showed the increase in depression with overall Internet use was statistically significant over the year-long period ($p < .02$).²

Moreover, differentiating types of Internet use and communication partners clarified these results. Use of the Internet for finding information, for entertainment, or for commerce was not associated with greater changes in depression than the base rate ($ps < .25$), but use for communication was. Because the online population had grown so much, the research could differentiate online communication with close ties from communication with weaker ties and strangers. More use of the Internet to communicate with weaker ties (in particular, to meet new people and to hang out in groups comprised primarily of strangers) was associated with increases in depression compared to the base rate (see point 3). In contrast, more online communication with friends and family was associated with declines in depression (point 4). Moreover, interaction results suggest a substitution effect. Respondents reported on their social resources on the initial questionnaire: their perceived social support, the number of friends with whom they regularly communi-

cated, and their extroversion. Compared to those who initially had fewer social resources, people who initially had greater social resources offline and used the Internet to communicate with strangers reported larger increases in depression than one would expect simply from their social resources or their Internet use alone (compare point 6 to points 3 and 5). In contrast, people who used the Internet to communicate more with friends and family had decreases in depression regardless of their initial social resources (compare point 7 with points 4 and 5).

This correlational data cannot determine why online communication with strangers and other weak ties was associated with increases in depression while communication with friends and family was associated with declines in depression. One possibility is that interactions with weak ties were simply less satisfying than interactions with family or friends. This explanation is suggested by other research we conducted, which asked survey respondents in a national sample to evalu-

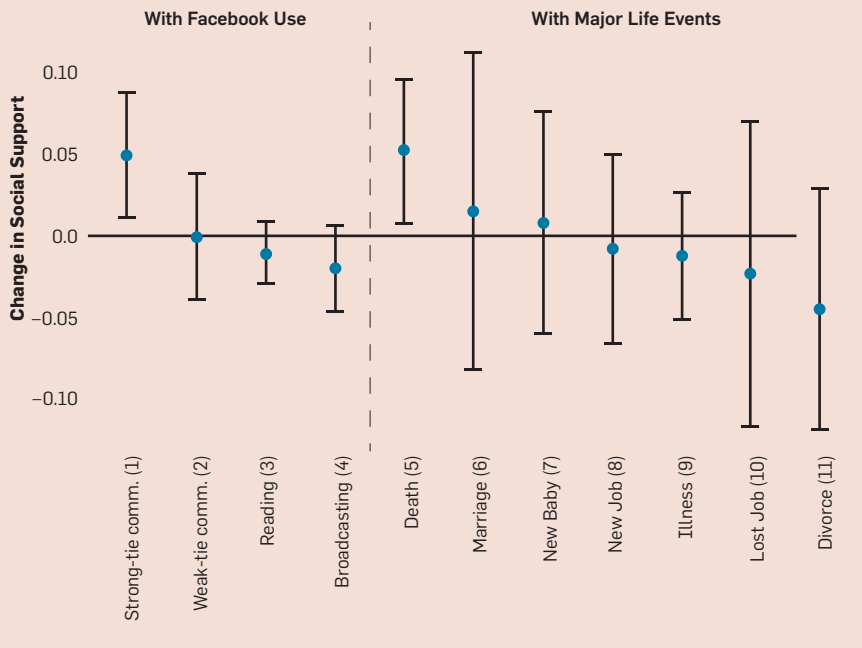
ate a specific online communication episode they had participated in the previous day.⁹ Another possibility is a substitution effect: interactions with weak ties reduced the amount of time and attention people had available to spend on richer and more valuable interactions with closer friends. This explanation is consistent with the finding that online communication with strangers was associated with increases in depression most strongly among individuals who had higher levels of offline social resources (social support) at the start of the study.

Our most recent research assessing how the Internet influences psychological well-being focused on the variety of uses people make of online social network sites, in particular Facebook.^{4,6,7} As of 2012, two-thirds of American Internet-using adults subscribed to an online social network, with Facebook being the most popular. Approximately 65% of Facebook's 1.4 billion monthly active users worldwide visit the site on a typical day.¹¹

The goal of this research was to assess how the well-being of Facebook users changed with different kinds of Facebook use and interaction with different partners. To conduct this analysis, we combined data from three surveys administered one month apart measuring social support, depression, and other aspects of psychological well-being with de-identified, aggregated counts of Facebook activity. The Facebook use data consisted of counts from server logs of online activity (for example, number of wall posts and comments posted and read, likes delivered and received, stories read, and photos viewed); no content was analyzed. Respondents reported how close they felt to up to eight of their Facebook friends, up to six of whom were close friends they identified (mean = 4.4 close ties) and the remaining ones randomly selected from their Facebook friend networks. They rated themselves as substantially closer to the ties they chose than to the randomly selected ties. Respondents' ratings of closeness were used to train a linear regression model to estimate their tie strength with each of their approximately 130 Facebook friends (see Burke⁵ for details of the estimation procedures). The large sample ($N = 1,927$ respondents communi-

Figure 2. Changes in self-reported social support over a month-long period associated with different uses of Facebook (left) and major life events (right).

The y-axis represents change in social support for an average Facebook user. Each point on the left shows the mean change in social support and its standard error associated with a standard-deviation increase in one of four uses of Facebook (communicating with strong ties, communicating with weak ties, reading others' broadcast content, and broadcasting one's own content). Each point on the right shows the association between changes in social support and major life events, such as a death in the family or getting married (adapted from Burke.⁵)



cating with over 2.4 million Facebook friends in total) and logs of participants' activity on Facebook allow us to differentiate types of communication: one-on-one exchanges such as wall posts or comments that were targeted at the recipient; reading friends' status updates that were broadcast widely rather than being tailored for a specific viewer; and broadcasting one's own content, such as status updates, game scores, and photos, out to a wider circle of friends. Confirmatory factor analyses demonstrated the validity of differentiating one-on-one communication from broadcast communication.

We hypothesized that one-on-one exchanges, by virtue of being tailored for a single recipient, would be more likely to increase social support, while reading broadcasts from a wider audience and sending them out would not, because they require less effort per recipient and are likely to deal with less intimate topics than messages meant for a single person. Using the tie-strength model, we were also able to distinguish whether the people they interacted with on Facebook were close friends or weaker acquaintances. Using a tie-strength threshold of 5 on a 7-point closeness scale to distinguish close from weak ties, 39.4% of participants' ties were considered "strong" and the median user had 38 strong ties ($M = 47$). The cutoff of 5 was both the mean and median tie strength for the ties participants selected as very close friends in the survey; however, the results we report here are substantively the same if we use a higher threshold and consider close friends to be ones with a threshold of 6 or 7 on the 7-point scale. Participants also reported recent major life events, such as the death of a family member or losing a job. We used these events as control variables in our models and as a baseline for understanding what constitutes a meaningful change in well-being.

Results paralleled our earlier studies. The relationship between Facebook use and well-being depended on how people used the site and with whom they communicated. As shown in Figure 2, receiving targeted, one-on-one communication such as private messages, wall posts, or comments from one's strong ties was associated with improvements in

perceived social support (see point 1), as well as happiness, self-reported health, depression, loneliness, negative affect and stress (all $ps < .05$). Reverse causation cannot account for these results; measures of initial psychological well-being did not predict changes in either respondents' communication with strong ties or the ties' communication directed at respondents. In contrast to communication with strong ties, communication with weaker ties (point 2), reading content such as status updates that were broadcast to a larger audience (point 3), or broadcasting one's own content (point 4) were not associated with these improvements in well-being. Moreover, the association of one-on-one communication with improvements in well-being was stronger for more substantive communication (for example, written comments) than for stylized, low-effort communication (for example, Facebook "likes").⁷

The effect sizes were large in comparison to the effects of other life events. For example, receiving a standard deviation more communication from strong ties—approximately 60 more comments—was associated with increases in perceived social support as large as those that occur following a death in the family, a time when the bereaved receive an outpouring of support and condolences from others (compare points 1 and 5 in Figure 2). The effect size for strong-tie communication was also comparable to the effect size for other major life events, like getting married, having a new baby, or losing one's job.⁶ In contrast, after accounting for this strong-tie communication, well-being did not improve with other Facebook activities, such as talking with weak ties, reading friends' broadcasts, or broadcasting content oneself.

Summary and Conclusion

Does penetration of the Internet into people's lives for connecting to other people, finding information, and entertainment have larger consequences, beyond directly supporting these tasks? The lessons from this literature review are both substantive and methodological.


In terms of substantive conclusions, research reviewed here is con-

sistent with a hypothesis that communicating online with close friends and family can have beneficial effects on psychological well-being as measured by declines in depression, loneliness and stress, and increases in perceived social support, mood, and life satisfaction. In contrast, many other uses of the Internet, including using the Internet for information, entertainment and communicating online with weaker ties, do not have similar, positive associations with psychological well-being. Indeed our earliest research showed that communication with strangers was associated with declines in psychological well-being.

Methodologically, one should be skeptical about conclusions drawn from cross-sectional research about its possible effects because preexisting differences in psychological well-being can shape how people use the Internet. Indeed, our research demonstrates different conclusions from cross-sectional and longitudinal analyses of the same data.²⁵ To better understand the relationship between Internet use and well-being, one needs longitudinal data and data that differentiates types of Internet use and classes of communication partners. Preexisting conditions like depression often cause withdrawal from social activities both online and offline; however, the analyses in this article control for respondents' initial well-being. Therefore differences in preexisting conditions like depression and its association with withdrawal from social interactions cannot account for the findings. We caution, however, that despite the advantages that derive from panel data, the analyses are correlational. Therefore, it is possible that *changes* during the measurement period in some third variable, like relocating, losing a job, or acquiring a serious illness, can shift both how people use the Internet and their psychological well-being.

Much has changed in the decades since we first began communicating on the Internet, and so in addition to being skeptical of cross-sectional, undifferentiated research, we must continuously reevaluate the impact the Internet has on our lives. For example, ubiquitous access via smartphones and other mobile devices has changed social norms of connectiv-

ity. The composition of our online networks has expanded to include grandparents and coworkers as well as many more strangers available on Twitter and other social media. In addition to text that dominated early online interpersonal communication, the genres of online interactions have expanded to include game-playing and the exchange of pictures and movies. Millennials have never known a world without the Internet. We can see detailed histories of our online interactions with Facebook friends and their relationships with others. There are many opportunities to investigate how these changes affect our well-being over the long term. However, our research over the past 15 years has demonstrated that, much like offline communication, the impact depends on the nature of the communication and with whom we are talking.

If use of the Internet does cause changes in psychological well-being, what is the nature of these “Internet effects”? Although evidence suggests the Internet, like print media and television before it, seems to have identifiable effects on psychological well-being, these associations do not imply a strong technological determinism. Human agency is key, because the technological effects depend upon how people decide to use technology. However, as with other daily-life activities, the way choices are framed and the effort involved in engaging in the activities are likely to bias the choices people make (see Thaler³⁰ for a fuller presentation of this argument). Even though people seem willing to invest more effort to communicate with closer ties than weaker ties and receive more benefits from interactions with them,²² modern information technology can change the effort needed to keep up with distant friends, to meet and have discussions with strangers, to have rich communication with specific ties or to have superficial interactions with acquaintances. These changes in effort can shift how people spend their time, which relationships they retain over time, and what they talk about. Thus, it is not the use of technology per se, but these decisions, which can be biased by technology, which directly influence psychological well-being. 

References

- Bessière, K., Kiesler, S., Kraut, R. and Boneva, B. Effects of Internet use and social resources on changes in depression. *Information, Communication & Society* 11, 1 (2008), 47–70.
- Bessière, K., Pressman, S., Kiesler, S. and Kraut, R.E. Effects of Internet use on health and depression: A longitudinal study. *J. Medical Internet Research* 12, 1 (2010), e6; <http://www.jmir.org/2010/2011/e2016/HTML>.
- Bikson, T.K. and Eveland, J.D. The interplay of work group structures and computer support. *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. J. Galegher, R.E. Kraut and et al. (Eds). Engleandates, Inc., Hillsdale, NJ, 1990, 245–290.
- Burke, M., Marlow, C. and Lento, T. Social network activity and social well-being. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems*. ACM Press, New York, 2010, 1909–1012.
- Burke, M. Reading, writing, relationships: The impact of social network sites on relationships and well-being (Ph.D. Thesis, 2011). Carnegie Mellon University, Pittsburgh, PA.
- Burke, M., Kraut, R.E. and Marlow, C. Social capital on Facebook: Differentiating uses and users. In *Proceedings of CHI 2011: The ACM Conference on Human Factors in Computing Systems*. ACM, New York, 571–580.
- Burke, M. and Kraut, R. Using Facebook after losing a job: Differential benefits of strong and weak ties. In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work*. ACM, NY, 1419–1430.
- Callaghan, P. and Morrissey, J. Social support and health: A review. *J. Advanced Nursing* 18, 2 (2008), 203–210.
- Cummings, J., Butler, B. and Kraut, R. The quality of online social relationships. *Commun. ACM* 45, 7 (July 2002), 103–108.
- Ellison, N.B., Steinfield, C. and Lampe, C. The benefits of Facebook ‘friends’: Social capital and college students’ use of online social network sites. *J. Computer-Mediated Communication* 12, 4 (2007), 143–1168.
- Facebook, Inc. Company info. Facebook, Menlo Park, CA, 2015.
- Hampton, K. and Wellman, B. Neighboring in Netville: How the Internet supports community and social capital in a wired suburb. *City & Community* 2, 4 (2003), 277–311.
- Harmon, A. Sad, lonely world discovered in cyberspace. *New York Times*, (Aug. 30, 1998), section 1, 1.
- Katz, J.E. and Rice, R.E. *Social Consequences of Internet Use: Access, Involvement, and Interaction*. MIT Press, Cambridge, MA, 2002.
- Kraut, R.E., Patterson, M., Lundmark, V., Kiesler, S., Mukhopadhyay, T. and Scherlis, W. Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist* 53, 9 (1998), 1017–1031.
- Marche, S. Is Facebook making us lonely? *The Atlantic* (May 2012).
- McKenna, K., Green, A.S. and Gleason, M. Relationship formation on the Internet: What’s the big attraction? *J. Social Issues* 58, 1 (2002), 9–31.
- Mikami, A.Y., Szewdo, D.E., Allen, J.P., Evans, M.A. and Hare, A.L. Adolescent peer relationships and behavior problems predict young adults’ communication on social networking websites. *Developmental Psychology* 46, 1 (2010), 46–56.
- Pope Benedict XVI. Truth, proclamation and authenticity of life in the digital age. June 5, 2011.
- Raine, L., Boase, J., Horrigan, J. B. and Wellman, B. The Strength of Internet Ties. Pew Internet and American Life Project, Washington, D.C., 2006.
- Rains, S.A. and Young, V. A meta-analysis of research on formal computer-mediated support groups: Examining group characteristics and health outcomes. *Human Communication Research* 35, 3 (2009), 309–336.
- Roberts, S.G. and Dunbar, R.I. The costs of family and friends: An 18-month longitudinal study of relationship maintenance and decay. *Evolution and Human Behavior* 32, 3 (2011), 186–197.
- Selfhout, M.H., Branje, S.J., Delsing, M., ter Bogt, T.F. and Meeus, W.H. Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality. *J. Adolescence* 32, 4 (2009), 819–833.
- Shaw, L.H. and Gant, L.M. In defense of the Internet: The relationship between Internet communication and depression, loneliness, self-esteem, and perceived

- social support. *CyberPsychology & Behavior* 5, 2 (2002), 157–171.
- Shklovski, I., Kraut, R. and Rainie, L. The Internet and social participation: Contrasting cross-sectional and longitudinal analyses. *J. Computer-Mediated Communication* 10, 1 (2004).
 - Shklovski, I., Kiesler, S. and Kraut, R.E. The Internet and social interaction: A meta-analysis and critique of studies, 199–2003. *Computers, Phones, and the Internet: Domesticating Information Technology*. R.E. Kraut, M. Brynin and S. Kiesler, (Eds). Oxford University Press, New York, 2006, 251–264.
 - Singer, J.D. and Willett, J.B. *Applied Longitudinal Data Analysis*. Oxford University Press, New York, 2003.
 - Steinfeld, C., Ellison, N. and Lampe, C. Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *J. Applied Developmental Psychology* 29, 6 (2008), 434–445.
 - Sutcliffe, A., Dunbar, R., Binder, J. and Arrow, H. Relationships and the social brain: Integrating psychological and evolutionary perspectives. *British J. Psychology* 103, 2 (2011), 149–168.
 - Thaler, R. and Sunstein, C. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Yale University Press, New Haven, CT, 2008.
 - Thoits, P.A. Mechanisms linking social ties and support to physical and mental health. *J. Health and Social Behavior* 52, 2 (2011), 145–161.
 - van den Eijnden, R.J.J.M., Meerkerk, G.J., Vermulst, A.A., Spijkerman, R. and Engels, R.C.M.E. Online communication, compulsive Internet use, and psychosocial well-being among adolescents: A longitudinal study. *Developmental Psychology* 44, 3 (2008), 655.
 - Walther, J.B. Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research* 19, 1 (1992), 52–90.

Recommended Reading

Burke, M. and Kraut, R. Using Facebook after losing a job: Differential benefits of strong and weak ties. In *CSCW’13: Proceedings of the 2013 Conference on Computer Supported Cooperative Work*. ACM, NY, 2013, 1419–1430.

Ellison, N.B., Steinfield, C. and Lampe, C. The benefits of Facebook ‘friends’: Social capital and college students’ use of online social network sites. *J. Computer-Mediated Communication* 12, 4 (2007), 143–1168.

Kraut, R.E. et al. Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist* 53, 9 (1998), 11017–1031.

Sutcliffe, A. et al. Relationships and the social brain: Integrating psychological and evolutionary perspectives. *British J. Psychology* 103, 2 (2011), 149–168.

Robert Kraut (robert.kraut@cmu.edu) is the Herbert A. Simon Professor of Human-Computer Interaction, in the Human-Computer Interaction Institute, Carnegie Mellon University, Pittsburgh, PA.

Maira Burke (mburke@fb.com) is a data scientist at Facebook, Menlo Park, CA.