

social networking sites is rewiring the human brain and if so, whether that is such a bad thing.

## Are Social Networks Messing with Your Head?

DAVID DISALVO

**BEFORE READING:** What sort of observations could you make about the type of people who use social networking sites? Have you noticed any changes in the type(s) of people who do?

Steve is the kind of guy who likes to let everyone know what he is doing in generous detail. His Facebook page is littered with entries such as “Just finished my java mochaccino and about to walk Schnooker” and “Lost recipe for my scrumptious caramel fudge cake . . . super bummed . . . sigh.” He is certain that his online friends want to know exactly what is going on in his life, and what better way to oblige them than with hourly, if not half-hourly, updates?

It is easy to dismiss what Steve and millions of social-network users do every day as the flower of banality, but in truth they are engaged in the largest worldwide experiment in social interaction ever conducted. The Internet has always provided a loose forum for the like-minded to congregate, but social networking contributes considerable structure to the chaos, allowing people to communicate more consistently and vigorously than ever before.

In a seminal paper published in 2007, social media researchers Danah Boyd of Microsoft Research New England in Cambridge, Massachusetts, and Nicole B. Ellison of Michigan State University offer a useful three-part definition of social-networking sites: they must provide a forum where users can construct a public or semipublic profile; create a list of other users with whom they share a connection; and view and move around their list of connections and those made by others. Sites that meet these specs include MySpace, LinkedIn, Bebo, Qzone (a massive Chinese site targeted to teens), and the global juggernaut Facebook. Others aimed at an even younger audience also fit, such as Disney’s Club Penguin, where kids interact as animated characters in a vibrant online world.

Since its launch at Harvard University in 2004, Facebook has grown in membership to more than 250 million people in 170 countries and territories on every continent — including Antarctica. If Facebook itself were a country, it would be the fourth most populous in the world, just behind the United States. Almost half its users

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visit the site every day. Other social-networking sites are also booming. LinkedIn, a site geared for professional networkers, has more than forty million users and adds one member every second. MySpace, the largest social network until Facebook overtook it last year, has 125 million users, and seven million Twitter users broadcast more than eighteen million snippets a day to anyone who will listen. Although adolescents and college students constitute about 40 percent of social-networking users, according to iStrategyLabs in Washington, D.C., the fastest-growing segments on Facebook are Gen Xers nearing age 40 and baby boomers pushing sixty.

Nielsen Online reports that social networking (and associated blogging) is now the fourth most popular online activity, ahead of personal e-mail and behind only search engines, general-interest portals such as MSM, Yahoo, and AOL, and software downloads. Time spent using social-networking sites is growing at three times the rate of overall Internet usage, accounting for almost 10 percent of total time spent online.

As social networks proliferate, they are changing the way people think about the Internet, from a tool used in solitary anonymity to a medium that touches on questions about human nature and identity: who we are, how we feel about ourselves, and how we act toward one another. To better understand this phenomenon, we will investigate the newest thinking about loneliness, self-esteem, narcissism, and addiction and the ways in which social networking might affect the expression of these traits. Old theories about online socializing are falling away, and fresh questions about the psychosocial relevance of social networking are constantly bubbling up.

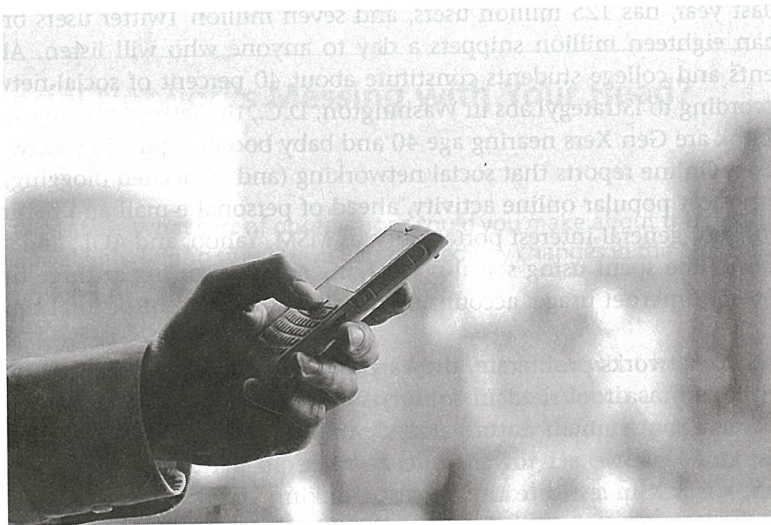
### All the Lonely People

We generally think of loneliness as physical isolation from other people. But that simple definition doesn’t begin to capture the condition’s pernicious nature: the deep distress people feel when they believe that their social relationships have less meaning than they should. This state can describe those of us wading through a sea of contacts on social-networking sites. Logic would have it that abundant social contacts would be a cure for the blues: the greater the number of contacts, the greater the chance of finding rewarding relationships. The truth of the matter is less straightforward.

Not so long ago the Net was presumed to be an unrelieved social backwater. “Nearly all the initial studies about people who used the Internet for social interaction suggested that they were getting lonelier,” says University of Chicago social neuroscientist John Cacioppo, co-author of *Loneliness: Human Nature and the Need for Social Connection*. Those studies were predicated on the notion that people used the Internet to replace face-to-face interactions and that relationships formed online would stay online. “For disabled users who couldn’t get around, that [practice] worked well,” Cacioppo says, “but for others, it didn’t.” A person could not even know for sure who was really on the other end of the line. Psychology research focused on this scene with critical eyes, often dismissing online socializing as lonely escapism from the disquiet of real relationships.



Per capita use of Facebook is up 175 percent in the past year, with many users logging on to the site and those of its rivals via mobile devices.

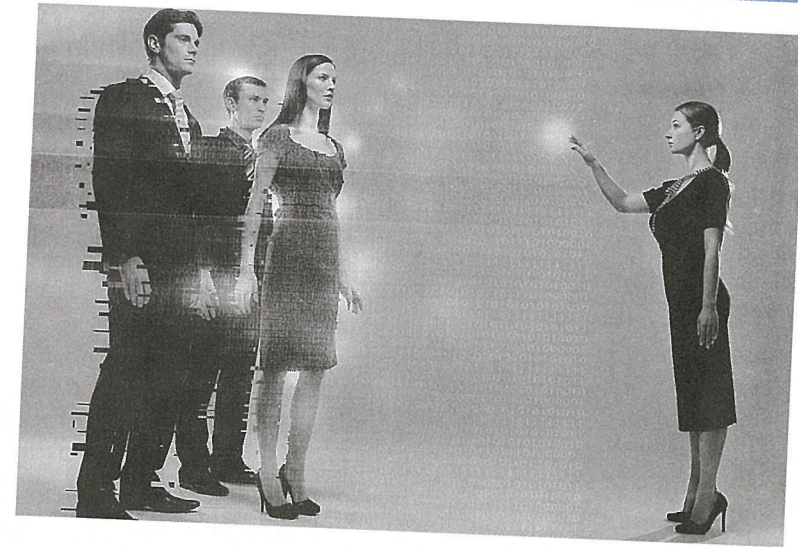


This dire view of social networking began to change as research grew more nuanced. In a 2008 study at California State University, Los Angeles, psychologists Kaveri Subrahmanyam and Gloria Lin interviewed 192 high school students about how they used the Internet for communication, how much time they spent online and which sites they typically frequented. The study participants then completed psychological tests for assessing loneliness and social support. Neither total amount of time spent online nor time spent communicating online correlated with increased loneliness.

These results echoed those of a 2006 study at the University of Sydney by psychologist Andrew Campbell and his colleagues, who found that the amount of time spent interacting online is unrelated to higher levels of anxiety or depression — typical cohorts of loneliness. Besides appearing to be no more socially fearful than other people, heavy online users also thought their time online was psychologically beneficial to them, despite reporting that they believed Internet users overall were lonelier than average.

A connection between loneliness and social networking only emerges when the variables are flipped, and researchers study loneliness as a precursor to membership in social networks. To understand why, consider some of the recent insights into the workings of the lonely brain. A 2009 brain-imaging study by Cacioppo and his colleagues showed that the neural mechanisms of lonely and nonlonely people differ according to how they perceive social isolation, the key ingredient of loneliness. While hooked up to a functional MRI machine, the subjects viewed a series of images, some with positive connotations, such as pictures of happy people and

The challenge of pervasive social networking is that it will supplant the richness of real-world relationships with an endless stream of trivial interactions.



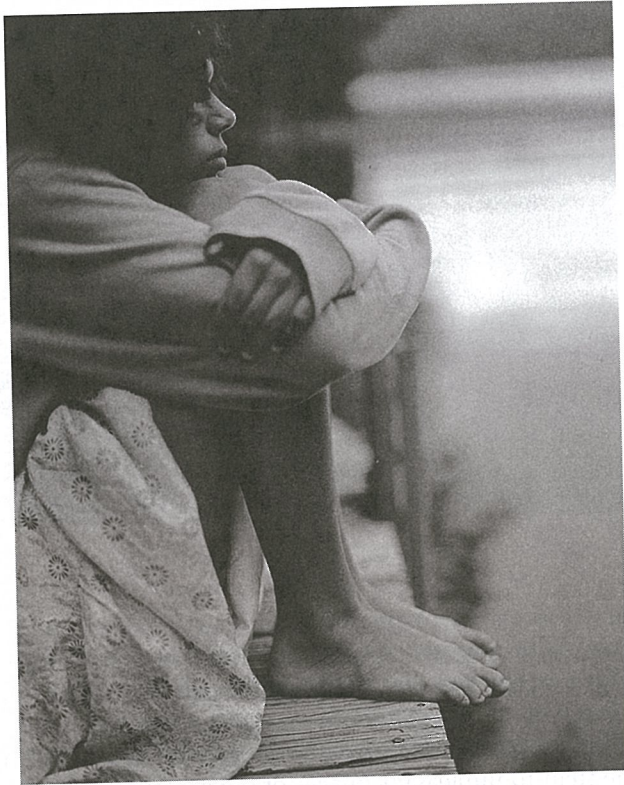
money, and others with negative associations, such as scenes of human conflict. As the two groups watched pleasant imagery, the area of the brain that recognizes rewards showed a greater response in nonlonely people than in lonely people. Similarly, the visual cortex of lonely test subjects responded more strongly to unpleasant images of people than to unpleasant images of objects, suggesting the attention of lonely people is especially drawn to human distress. The nonlonely showed no such difference.

These variations in brain activity hint at why a predisposition to loneliness is such a liability for social networkers. "When you're lonely, your brain is in a heightened state of alertness for social threats, even if you're not explicitly looking for them," Cacioppo explains. Insults, snubs, alienation and gossip all elicit much higher levels of stress in the lonely, measurable in part by elevated production of the stress hormone cortisol. The effect is amplified online because social threats are more difficult to anticipate there. A long silence between replies during an online chat can spawn fears that others are locking you out of the conversation and gossiping behind your back. Another source of insecurity is the very currency of social networks: the number of contacts one has. Having a mere handful of contacts when others could fill a stadium with their roster can leave lonely individuals feeling that their desires are moving ever farther out of reach.

It is not surprising, then, that the social networkers who fare the best are the ones who use the technology to support their existing friendships. In a 2007 study of older adults, gerontology doctoral student Shima Sum of the University of Sydney



Social networks may spawn insecurity and anxiety in lonely people, because social threats are hard to read online. But the networks can lessen loneliness if a person's online contacts are also friends in real life.



and her colleagues found that using social networks diminishes loneliness when online social contacts are also offline contacts. When older adults try to use social networks to meet new people, however, they consistently feel lonelier than they did before.

Indeed, face-to-face interaction appears to be the pivotal variable in social-networking effects. In a 2009 study of loneliness and Facebook membership, psychologist Laura Freberg of California Polytechnic State University and her team found that college students who are socially connected in their face-to-face lives bring that persona online and really do derive benefits. The lonely students who used the technology became lonelier.

For try as they might to put on a new set of psychic clothing, lonely people bring their true personalities online, too. A lonely and socially inept person might, for a while, assume the persona of an outgoing and gregarious conversationalist but will have a hard time sustaining the charade. "Loneliness is the deficit between what you want and what you have," Freberg says, "and chronic loneliness makes people

act in ways that push others away. Social networking isn't equipped to handle that and can actually make it worse." Social networks might not make people anxious and fearful, but if they feel that way to begin with, others will know soon enough.

### Looking in the Mirror

Social networks should, in theory, be a boon for people who need a boost to their self-esteem. They are ready-made venues for testing social skills without the looming embarrassment of failing in the flesh. In a 2008 study of Facebook users, social media researcher Cliff Lampe of Michigan State teased out how advantages can accrue for some online networkers. Lampe's team surveyed 477 Facebook members at the beginning and end of a one-year study period to weigh changes in various measures of psychological well-being. Facebook use correlated strongly with an increase in social capital — tangible social benefits derived from participating in a social network — especially for those with low self-esteem. Social capital boosts self-esteem like high-octane gas boosts a car's performance, conferring better social skills, greater feelings of contentment and increased confidence.

Positive effects were most profound for teens, who seem set to profit over the long term. "Adolescents find ways to make use of these benefits in other parts of their lives," Lampe says, most notably through a greater sense of self-confidence when interacting in person, "so there's a multiplier effect." Communications researcher Patti M. Valkenburg of the University of Amsterdam School of Communications Research in the Netherlands came to the same conclusion in a 2009 study on the social consequences of Internet use for adolescents. Membership in a social-networking site, she found, builds self-esteem by enhancing the development of friendships and the quality of existing relationships.

Adolescents do well on social networks because the context of the Internet helps to stimulate disclosure and self-presentation. Unlike face-to-face communication, social networking allows only limited visual and auditory cues. "Adolescents are less hindered by emotions and physical bothers," Valkenburg says. But not all teens will benefit. Just as for lonely social networkers, adolescents gain when they use the Internet primarily to maintain their existing network. And although using social networks tends to boost self-esteem overall, a predisposition to low self-esteem will intensify the blow from failure whether in person or online.

Perhaps because they are simple to join and make communication so easy, social networks have become havens not only for people with a poor self-image but also for those who seem overly pleased with themselves. Indeed, a recurring criticism of social-networking sites is that they are forums for narcissists demanding the world's attention. Narcissists revel in collecting social contacts — the more the better, no matter how superficial the underlying relationships. And they hijack message boards to ensure that they are the star attraction.

But the same forum that feeds narcissists can also be their undoing. Social psychology doctoral student Laura Buffardi of the University of Georgia conducted an experiment to find out what defines online narcissists and how easily others



can pick them out. Buffardi and social psychologist W. Keith Campbell ran 130 Facebook users through the Narcissists Personality Inventory (NPI), a research tool that measures narcissism through a questionnaire with a series of choices. Test takers select which of two statements better describes themselves — for example, “I am more capable than other people” versus “there is a lot I can learn from other people.” People who score high on the NPI are more likely to cheat and game-play in relationships, monopolize resources, and be excessively materialistic.

What emerged is that online narcissists behave much like offline ones, amassing numerous but shallow relationships and engaging in ceaseless self-promotion. People can generally spot them, too. When untrained strangers viewed a sample of Facebook pages, they were just as good at identifying the narcissists as previous research has found people to be at judging the personality of their friends. The observers pointed to three characteristics that they felt betrayed the narcissists: a large number of contacts, a glamorous appearance, and a staged quality to the main photo.

Narcissists on social-networking sites may not be able to hide from their critics, but a more interesting question might be when their narcissism began: Do they arrive as fully formed egotists drawn to a stage they cannot resist, or are the sites themselves playing a role in creating narcissists? Here the research is inconclusive but intriguing. Some studies suggest that aggregate NPI scores in the U.S. have changed little since 1982; others have found significant upticks in narcissism among some groups of young adults starting in 2002 — which happens to coincide with the birth of social networks. But whether the sites are a breeding ground for narcissists or just a watering hole, it is hard not to think of the spectacular rise of social networking as part and parcel of the culture of entitlement.

### Overdoing It

These days people toss around the term “addiction” as casually as they would a Frisbee. But whatever you call an unhealthy attachment, people are spending ever more time on social networks, and some are getting into trouble over it. For context, Nielson Online reports that the seventy million Facebook members in the U.S. spent 233 million hours on the site in April 2009, up from twenty-eight million hours by twenty-three million members the previous April — a 175 percent increase in per capita usage. And according to a study by Nucleus Research in Boston, the most avid users are spending two hours a day on the site while they are at work — helping to cost companies whose employees can access Facebook 1.5 percent of total office productivity.

It is no mystery why social networks have such a pull. Like television, video games and other forms of electronic media, social networks are superb at delivering instant gratification. Judith Donath, director of the Sociable Media Group at the Massachusetts Institute of Technology’s Media Lab, says: “Social networking provides a series of mini mental rewards that don’t require much effort to receive.” These rewards serve as jolts of energy that recharge the compulsion engine, much like the frisson a gambler receives as a new card hits the table. Cumulatively, the effect is potent and hard to resist.

Facebook use can boost self-esteem in adolescents, stimulating disclosure and self-presentation, and giving them a greater sense of self-confidence when interacting in person.



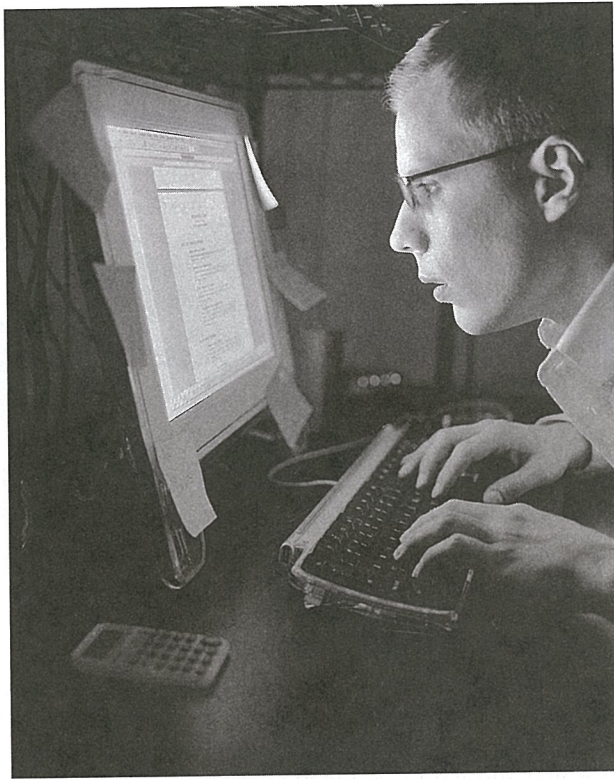
Most people will not imperil their psyches if they spend a little more time on social-networking sites. For them, two hours a day on Facebook may simply mean 25 two hours less in front of the TV. But for people who bring a compulsive personality to the keyboard, those hours can grow rapidly, setting off a cascade of bad consequences at home and work. “Someone with obsessive-compulsive tendencies is predisposed to a range of addictive behaviors,” says neuroscientist Gary Small of the University of California, Los Angeles, and author of *iBrain: Surviving the Technological Alteration of the Human Mind*. “Technology has a way of accelerating the compulsive process.” In the U.S., the group at risk is pretty big: one in fifty adults has some degree of obsessive-compulsive disorder.

A consistent factor across many of the studies in this realm is that social networking is simply a new forum for bad habits. Social media researcher Scott Caplan of the University of Delaware says, “People who prefer online interaction over face-to-face interaction also score higher on measures of compulsive Internet use and using the Internet to alter their moods.” In 2007 Caplan conducted a study of 343 undergraduate students to determine what stoked the fires of compulsive behavior online. He homed in on personality traits that leave people vulnerable, such as loneliness and social anxiety, and online activities that attract people with compulsive tendencies, such as playing video games, watching pornography, and gambling.

Of these variables, social anxiety emerged as the strongest. “Socially anxious individuals who have problems with face-to-face interactions are drawn to the



The Internet is a magnet for people with obsessive-compulsive tendencies. Social networks can deliver the same kind of instant gratification that television and video games do.



unique features of online conversation," Caplan says. In time, they may start using social networking compulsively to regulate their mood, and the self-feeding cycle begins.

### Social Networking Tomorrow

Pervasive as it already seems to be, social networking is poised to invade even more areas of our lives. "We're moving into a time when the distinction between being online and offline is going to disappear," Lampe says.

The challenge will be to keep a constant deluge of social connectedness from diluting our real-world relationships by drawing us into trivial interactions. Social networking is what psychologists call a thin-strand technology, lacking many of the essential elements of communication, such as body language and touch. "The power of face-to-face interaction is fundamental to what we are," Cacioppo says.

"We need the richness of it in our lives, and this richness affects our brains." Eventually, he believes, the interaction strands of social networking will grow richer. Cacioppo envisions a time when instead of communicating online in two-dimensional space, we will interact as holograms and preserve more of what makes face-to-face interaction vital.

A dynamic application we are likely to see sooner is cognitive filtering. "The social-network infrastructure is going to be baked into all sorts of different tools, most notably media-sharing services," Boyd says. Cognitive filtering will let users focus on information already vetted by their networks, saving time and aggravation. As you are flipping through movie listings on your smart phone, say, you might first see starred recommendations from your social network and then the other films whose ratings made your cutoff score. The danger is that the technology could limit the perspective of its users and breed insular thinking, turning us into a society of myopic cliques.

And that, in microcosm, is why social networking is such an important phenomenon. Beyond dessert recipes, funny pet stories, and tales of what the baby did for the first time this morning, a transformational current is surging. What once seemed a faddish online application is on its way to global ubiquity. Before long, social networking may be part of every communication tool we use — changing how we interact with one another and, in the process, changing us.