

# Isolating the Costs of Loneliness

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Recently, in the course of some research unrelated to this article, I stumbled across an old letter from F. Scott Fitzgerald to Ernest Hemingway written in June of 1929. Fitzgerald had read a typescript of what soon became *A Farewell to Arms* and was offering his mercurial friend some critique. What Hemingway thought of this review can be inferred by a note he appended to the letter, requesting that Fitzgerald apply his lips to that part of the human anatomy typically reserved for sitting. But one comment must have stirred even Hemingway's hardest of hearts: Fitzgerald praised a particular passage as not only among the author's personal best, but as "one of the most beautiful pages in all English literature."

That evening I tracked down the source of this acclaim in my copy of the book. I found a familiar paragraph that culminates with the famous line: "The world breaks every one and afterward many are strong at the broken places." What struck me then, however, more than during previous readings, was that Lieutenant Henry, the book's protagonist, reaches this conclusion after a lengthy stream of thought on the nature of loneliness. Henry has realized that with Catherine Barkley he doesn't feel alone. This is strange, because simply being with someone often does nothing to dampen loneliness — on the contrary, he thinks, "that is the way that you can be most lonely." It is even stranger because his lack of loneliness persists even into the night, which "can be a dreadful time for lonely people once their loneliness has started." At the close of the book Henry stands helpless as his wife dies during childbirth, then leaves the hospital alone.

Until the second half of the twentieth century, explorations of loneliness were largely reserved for writers, musicians, painters — reserved, in short, for the arts, and not the sciences. It is fitting, then, that when the sociologist Robert Weiss published one of the first scientific looks of loneliness, in the early 1970s, one of his case studies largely reflected Hemingway’s fictional portrayal. It involved a widower, a Mr. Neilson, whose wife had died during childbirth. During the day Neilson was surrounded by many people — coworkers, drinking companions, his sister who had moved in to help him, his five remaining children — but still found his existence a lonely one. Nights, of course, were even tougher. “I get an empty feeling in the nights,” Neilson told Weiss, “I really do.”

Weiss’s *Loneliness: The Experience of Emotional and Social Isolation* itself had little company upon its publication in 1973. Despite the cultural prevalence of isolation — a contemporary survey, noted Weiss, found that one in nine Americans felt severely lonely within the past week — the topic had been remarkably ignored by the behavioral literature. “We are lacking,” he wrote, “in studies that would describe what loneliness is and explain why it is that way.” As a result, people tended to underestimate the crippling effects loneliness had on well-being. They often viewed solitude as a virtue — the strong one, emerging victorious from the masses — or saw lonely people as frail souls who could surely find some partner or purpose if they would only try harder.

Weiss’s work “stimulated the scientific study of loneliness,” says APS Past President John Cacioppo, University of Chicago, a current leader in the field. Since then, the scientific understanding of loneliness has advanced significantly. A group of scientists canvassed the emerging literature and concluded, in a 1988 report in *Science* (House et al.), that social isolation was as much a risk factor for illness as high blood pressure, obesity, and cigarette smoking. More recently, brain imaging work has shown loneliness to interfere with executive functioning, and cellular tests have traced its impact down to the level of genetic expression. Cacioppo’s own research, forming the basis of his new book, *Loneliness* (2008), has found that social isolation grinds the body through a physical wear-and-tear essentially akin to “premature aging.”

This heightened understanding of loneliness, argues Cacioppo, can guide methods of easing the lonely back toward salutary social connections. Those who recognize themselves as isolated can take active measures toward reestablishing connections; loneliness, in that sense, can serve as a primal call to arms rather than an abject farewell.

Yet despite the progress, many misconceptions of loneliness have carried over from Weiss’ time — most notably the perceived virtue of solitude — creating a potentially urgent problem for a society living increasingly alone. By 2010, some 29 million people will live by themselves, up 30 percent since 1980. When surveyors asked people how many confidants they had in 1985, the most common answer was three; the same question, posed in 2004, elicited a most-common response — at a quarter of the respondents — of none.

“We treat [loneliness] like it’s some disease, like it’s a personality weakness,” Cacioppo said recently. “We don’t pay attention to a signal we’re biologically designed to use to be happier, healthier beings.”

## **The Ringmaster**

In *Loneliness*, Cacioppo and his coauthor, science editor William Patrick, devote a large portion of space

to the evolutionary roots of social support. Across vast swaths of human ancestry, they argue, evolution fashioned people to feel secure when with others, and to feel threatened when alone. “As a species we’re designed to work together and trust one another,” Cacioppo said. “Thousands of years ago, we needed others to prosper and survive, and when we’re infants we [still] need that now.” The authors rally a collection of anthropological and genetic theories, too vast to consider here in full, toward their basic premise: social connection is a fundamental part of the human system. With this evolutionary foundation in place, it becomes easier to understand exactly why isolation causes our natural health systems to strain, and break down entirely.

To evaluate the effects of loneliness across a lifetime, Cacioppo and his colleagues focused primarily on two subject pools. The first, a group of undergraduate-age students, underwent a variety of psychological and physiological tests. Often these occurred at the same time. The students were outfitted with beepers that chirped many times a day over the course of several days. When the beeper went off, the students filled out various forms designed to gauge their loneliness — all while biosensors at their hips gathered cardiovascular measurements. The second group, a representative sample of people ranging in age from about 50 to 70, participated in equivalent tests during five years of longitudinal observation.

When the comparisons were drawn, and a few other studies accounted for, Cacioppo’s group pinpointed five paths from loneliness to poor health. The results, originally collected in the August 2007 issue of *Current Directions in Psychological Science* (Hawkley, 2007), were expanded upon in *Loneliness*. For one, lonely people in the older group took worse care of their bodies, exercising less often than all subjects in the younger group and generally engaging in more destructive behaviors. This same group also felt more stress, both real and imagined: Lonely participants in the older group reported 25 percent more stressors than did the contented subjects. In the younger group, no such difference appeared — though lonely participants in both groups perceived their stresses as more severe than did the non-lonely.

A fourth factor, on acute physiological differences, was particularly telling: Compared to non-lonely subjects, lonely people in the older group showed higher bodily traces of epinephrine, a stress hormone, and their isolation was correlated to changes in DNA that negatively altered the circulation of cortisol, the body’s stress regulator. Finally, lonely subjects in both groups took longer to fall asleep and had a poorer quality of sleep, as Mr. Neilson or Lieutenant Henry could have attested. In each of these circumstances, says Cacioppo, loneliness “is not just another characteristic, but a ringmaster — a central player.”

While the gruel of isolation smolders for years beneath a lonely frame, chipping away invisibly, the mind too fractures from the weight of one. In a study published in the *Journal of Personality and Social Psychology* in 2002, APS Fellow Roy Baumeister and colleagues gave intelligence tests to subjects in three different groups. One group had been told before the test they would have close relationships throughout their lives; another was told just the opposite; a third was told unrelated bad news. On simple memorization questions, the groups scored equally. On sections involving logical reasoning, however, subjects primed for loneliness performed much worse. In a later study by a separate research group, brain scans conducted during math tests showed less activity in the brain’s executive functioning region among participants who felt isolated.

Loneliness also seems to interfere with the functions of mirror neurons — those agents of empathy used

by the brain to infer the experience of others. (To read more on mirror neurons, see the [May 2007 Observer](#).) In various tests, lonely subjects interpreted facial images of anger, fear, happiness, and sadness less accurately than did non-lonely counterparts. Other tests found that lonely people fixated on negative images, such as that of a person in peril. Still others showed a tendency toward being distrustful among lonely players in a trust game.

“When we feel lonely,” Cacioppo and Patrick write in *Loneliness*, “we tend to scan the horizon for any possibility of social danger, but with an eye toward protecting ourselves rather than with genuine concern for what others may be thinking or feeling.” What’s more, people who expect a person to be lonely tend to consider them as less sociable, and behave less socially toward them. It is as though the lonely brain erects a fortress of solitude from within, while those on the outside dig the moat.

## Castaways

Many isolated people, unable to reach out to others, reach out instead to objects. In a series of recent studies led by Nicholas Epley, coauthored by his University of Chicago colleague Cacioppo, researchers found several instances in which lonely participants appeared to fill the void of human connection with inanimate ones (Epley, 2008). In one test the researchers presented socially isolated subjects with a collection of gadgets, such as Clocky, the alarm that wheels itself beyond the outstretched arms of snoozers-to-be. Compared with non-lonely participants, the lonely issued the gadgets higher anthropomorphic ratings — Clocky, to the lonely, had more of a “mind of its own.”

Another study, published alongside the first in the February 2008 issue of *Psychological Science*, primed different subject groups toward feeling isolated or neutral. The former watched clips of *Cast Away*, a drama about a man stranded on an island, and the latter viewed *Major League*, a comedy. Afterwards, the subjects attributed various traits to a pet. The castaways were more likely than the major leaguers to characterize the pets with a socially connected trait, such as “sympathetic,” as opposed to a neutral description, such as “muscular.” They also showed a slightly stronger belief in the supernatural. “Lonely people cannot make themselves a world, of course,” the researchers concluded, “but they can make themselves a mindful gadget, a thoughtful pet, or a god to populate that world.”

This phenomenon appears particularly important in a society where the gadgets increasingly play the role of the puppy — cordoning off social connections on subways, sidewalks, and even across offices, with wireless rope. One of the first scientific studies on the social impact of online connections came out of Carnegie Mellon University in the mid-1990s (Kraut, 1998). The research group, led by APS Fellow Robert Kraut, wanted to measure the social relationships of Internet users. The Web was far from unknown, at that time, but its use was so scarce in the nearby Pittsburgh community that the scientists had to provide the 93 test families with the necessary software, phone lines — even computers.

The researchers tracked Internet usage for two years; they recorded the number of emails sent and the number of domains visited, all the while measuring loneliness, depression, and stress. Prevailing wisdom at the time suggested that the Internet, as a tool for social connection, would enhance a user’s relationships. Instead they found almost exactly the opposite. As Web use increased, family dialogue decreased, social circles shrunk, and loneliness and depression rose, the group reported in the September 1998 *American Psychologist*. “We expected a very straightforward result: As people use the Internet more ... that would translate into less loneliness, less depression, more friends, larger social

circles,” Kraut recalled recently. “It was shocking.”

Follow-ups to this work offer a more hopeful picture. As online connections change in nature, the isolation bred by Web use becomes less universal. In a study published in 2008, Kraut and colleagues found that depression scores actually decreased among those who used social network tools, such as Facebook and MySpace, to communicate with friends and family (Bessière, 2008). But those who used the Internet primarily to converse with strangers showed increased depression — perhaps as a result of sacrificing strong existing relationships for flimsier ones. (The new research failed to reveal a significant connection with loneliness, says Kraut, for reasons he can’t explain, though depression and loneliness remain strongly linked.)

Such results, says Cacioppo, emphasize that it is the quality of a few relationships, as opposed to a quantity of supposed friends, that makes a person feel socially contented. This could explain why Americans remain culturally lonely despite having the highest reported number of friends in a recent international survey. “If you sacrifice face-to-face interactions for online interactions — if you have four thousand friends on Facebook instead of one good friend right next to you — you’re more lonely,” he says.

### **Restorative Measures**

Unlike latent afflictions that can lay undiscovered for years, plenty of warning signs call attention to social isolation. A recent study, published in the September 2008 issue of *Psychological Science*, found evidence for perhaps the most basic of alert signals: the chills (Zhong, 2008). In one test, subjects excluded from a game gave lower estimates of room temperature than did those who took part in an inclusion game. In a second test, those excluded from a similar game declared a greater desire for warm food or drink. The results could prompt a reexamination of seasonal affective disorder — feelings of depression among the generally healthy come winter time. Perhaps it is no coincidence that Weiss, back in 1973, found loneliness in general to be “almost as prevalent as colds during the winter.”

The link between coldness and loneliness, then, is more than metaphorical, says Chen-Bo Zhong, University of Toronto, the study’s lead author. “What’s going on in our head, or what we think is going on, isn’t always restricted to our head — it connects to the body in general,” Zhong said recently. In turn, the body offers the mind a way to respond: social connections increase the flow of oxytocin, a chemical that literally distributes warmth throughout the body.

Along the same lines, a group of researchers found a few years back that social rejection literally hurts. Led by Naomi Eisenberger of the University of California, Los Angeles, the scientists put subjects through a social exclusion game similar to the one employed by Zhong. As the game unfolded, and some of the participants were excluded from the virtual ball-tossing, Eisenberger and colleagues collected functional brain images of the anterior cingulate cortex — an area linked to physical pain. When subjects were excluded, the brain scans detected increased activity in this cortex. Social pain, concluded the researchers in an October 2003 issue of *Science*, “is analogous in its neurocognitive function to physical pain, alerting us when we have sustained injury to our social connections, allowing restorative measures to be taken.”

Toward the end of *Loneliness*, Cacioppo and Patrick offer some restorative measures of their own. Their

advice ranges from extending yourself in small bursts of daily conversation, to focusing on quality relationships, to simply expecting good results. To some, such efforts might seem too simplistic. To the seriously afflicted, they might even seem too daunting. In most cases of loneliness, though, there is no quick fix — only the certainty, founded upon an advancing science, that isolation will wear us down over time. For that reason, Cacioppo and Patrick conclude, it is necessary to bear in mind our social roots and to understand that rugged isolationism, despite its temporary advantages, is in the long-run a grave, debilitating choice — a resignation that the world breaks everyone, instead of the resolution that we can be strong again at the broken places.