THIS IS YOUR BRAIN ON E-MAIL

If the medium is the message, what does that say about new survey results that found nearly 60 percent of respondents check their e-mail when they're answering the call of nature?

—Michelle Masterson, Channel Web

Now that handheld devices give us 24/7, virtually worldwide access to e-mail, there is nowhere, it would seem, that people do not pause to check it. We log on during the drive to work, download a few messages on the train ride home; we look at it in the bath and in between sermons at church. Sixty-two percent of Americans check their e-mail on vacation and respond to work queries, at a time when they're supposed to be relaxing. According to *Merriam-Webster's Collegiate Dictionary,* "vacation" means "a respite or a time of respite from something" or "a scheduled period during which activity (as of a court or school) is suspended." Nothing is suspended in the wired vacation of the twenty-first century. Any time there's a moment of silence, a break between moments, e-mail insinuates itself with stunning regularity. "You know those pregnant pauses you have on elevators? That's a great time to pull out a BlackBerry and get some

work done," says Raul Fernandez, the CEO of Dimension Data North America.

There is no downtime anymore, even at bedtime. Sixty-seven percent of the four thousand people age thirteen and over surveyed in AOL's 2008 e-mail addiction poll admitted to having checked e-mail in their bed, in their pajamas. In the 1996 film *She's the One,* Jennifer Aniston is married to a distracted financier who cares more about his job than his wife; we know this because he takes his laptop to bed. Now many of us are doing the same, even if our devices have shrunk along with our trust in financiers. Sean Young of Phoenix is one. He logs on before and after the gym, by the pool, in the car, and leaves his handheld inches from his face at night so he never misses a message. "I just realized I have a problem," Young said, describing his daily routine of message consumption in an e-mail to a reporter.

He's not alone. *Nearly half the people* in AOL's survey claimed that they were addicted to e-mail. The technology that was supposed to set us free to work from anywhere, to check in and clock out on our own time, has now become the longest employee leash ever invented because we can't seem to log off. We haven't just tried to merge with the machine, to marry the damn thing; it has become our iron lung. "I have friends and relatives that carry BlackBerrys with them 24 hours a day, fully prepared to drop anything in their lives and work at a moment's notice," wrote Tim O'Leary, the CEO of a marketing firm. "I'm tethered to my laptop as if it were an oxygen machine I must cart around to keep me breathing." The word "crackberry" was *Webster's New World College Dictionary*'s 2006 word of the year.

The most "addicted" metropolis in America is, not surprisingly, New York, the city that never sleeps—and apparently never stops clicking: 50 percent of Gothamites feel they are

addicted to their e-mail. Lunch hour in Manhattan can sometimes feel like an outtake from a strange daylight zombie film: e-mail drones, flicking and scrolling through their handhelds, checking e-mails that they could just as easily read twenty minutes later at their desk, are given a wide berth on city streets by the not-yet-addicted.

There are several reasons for this burgeoning obsession. Mail has always traveled to us with a small but palpable comet trail of anticipation. Regular delivery of the post created a daily rhythm of expectation. We know that bills and official forms will come. But there might also be postcards from friends, Christmas cards, magazines, or maybe more. In 1967, the direct marketing firm Publishers Clearing House launched a prize giveaway. It might not just be your subscription of *Runner's World* in your mailbox; it might also be a $1 million check with the "prize patrol" in tow.

Now that our inboxes have become both our most used mailbox and virtual doorstep, it's hard not to have the same complicated mixture of good and bad expectations when checking e-mail. Except that we no longer have to wait. The BlackBerry was introduced in 1999 and by 2004 had 1 million users, a number that doubled ten months later. As of June 2009, that number had reached 28.5 million worldwide, and that doesn't even count people using e-mail-enabled cellular phones. Millions upon millions of people the world over now can and do constantly access their e-mail. Psychologists have discovered that their behavior in doing so is very like that of people sitting before a slot machine.

Neurologists now understand why these standbys of casinos are addictive: they work on a principle called variable interval reinforcement schedule, which Tom Stafford, a lecturer in the Department of Psychology at the University of Sheffield, explained has been established as the way to train the strongest

habits. "This means that rather than reward an action every time it is performed, you reward it sometimes, but not in a predictable way. So with email, usually when I check it there is nothing interesting, but every so often there's something wonderful—an invite out, or maybe some juicy gossip—and I get a reward."

There are chemical reasons for why this reward feels good, reasons that go beyond the quality or rarity of the gossip. The midbrain is constantly trying to make predictions about when we will and won't be rewarded. Brain imaging is beginning to show that when we get a big reward—such as a jackpot payout—dopamine, the hormone and neurotransmitter, floods the anterior cingulate, the part of the brain that appears to control mechanical functions such as heartbeat and breathing, as well as rational functions such as decision making and reward anticipation. If we're performing an action that doesn't always pay out, but does *some of the time,* such as playing the slots, the lesson learned is that if we want a reward we need to keep pulling that lever.

So it is with our e-mail. We need to keep clicking that send/receive tab—even when our computer is set to automatically check e-mail every ninety seconds—to get the reward we've come to expect will arrive sooner or later. *Someone is thinking of me.* The addictive nature of working in this environment has been good for response rates. In one recent survey, it took people an average of just one minute and forty-four seconds to respond to an e-mail pop-up alert on their computer. Seventy percent of alerts provoked a reaction in just *seven seconds.*

As with any vice, it's a disaster when you take e-mail away, even if for only a few hours. When the BlackBerry network went down for several hours one night and into the next day in 2007, it deprived 8 million users of their wireless e-mail. Many of them panicked. "My blood ran cold," said one real

estate consultant, who was traveling on business. "I was offline." In the summer of 2008, Google's popular Gmail service went down for just a few hours, and the company was flooded with responses. "We feel your pain and we're sorry," the company wrote on its blog. Going offline causes huge amounts of stress for companies, especially small ones. A survey done in England revealed that "77 percent of office workers and company owners agree that e-mail downtime causes major stress at work." Forty percent responded with agitated mouse clicking. Ten percent physically assaulted their computers. Postcards may have been a craze, but there's nothing that even compares to this level of devotion to e-mail.

The physiological qualities of e-mail dependency, if they don't grow out of a psychological dimension, can soon acquire one, as with any chemical dependency. "If I didn't hear 'beep-beep' every time I turn on the computer," said one senior citizen who adopted e-mail in 1994, "I'd die." E-mail has become a way to be reminded that we exist in a world overloaded with connections, that we are needed. Out of the Internet we have constructed a new communications environment that enables us to constantly feed that need—to be plugged in, surrounded by links to all of our friends and colleagues. Artemio Ramirez, Jr., an assistant professor at the Hugh Downs School of Human Communication at Arizona State University, points out that e-mail addicts are people who like to feel desired, and needed, which, as the statistics bear out, is a lot of us. "It makes us feel as part of a community or network," Ramirez said. It's a basic human desire—yet the way that e-mail has speeded it up has destroyed our ability to want much else.

For these reasons, some psychologists are pushing to have "Internet addiction" be broadly classified as a clinical disorder. Dr. Jerald Block of the Oregon Health and Science University

is one of them, and he says that sufferers show all the classic signs of addiction. They forget to eat and sleep, require more advanced technology and higher doses—in this case, a larger volume of e-mail, a constant connection to it—to get their fix. But they are in for perpetual disappointment. "When we log in to our e-mail server," writes Richard DeGrandpre in *Digitopia,* "the expectation of finding new mail negates any possible excitement or surprise; if there's no new mail, we're disappointed." So we check it more and more. As the condition progresses, sufferers feel increasingly isolated from society, become argumentative, and fall into depression. They spend time gaming online, looking at news and pornography, and e-mailing. Early sufferers, Block says, tended to be highly educated, socially awkward men, but now more and more they are middle-aged women who are either at home alone or working. In fact, there's no better place for an Internet addict these days than at work.

Working in a Climate of Interruption

In the era of e-mail, instant messaging, Googling, e-commerce and iTunes, potential distractions while seated at a computer are not only ever-present but very enticing. Distracting oneself used to consist of sharpening a half-dozen pencils or lighting a cigarette. Today, there is a universe of diversions to buy, hear, watch and forward, which makes focusing on a task all the more challenging.

—Katie Hafner

What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates

a poverty of attention, and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.

—Herb Simon

We work in the most distraction-prone workplace in the history of mankind. We can be reached on the phone, by fax, instant message, Facebook, text message, cellular phone, letter, and occasionally in person. Throughout the day, for many people and especially for the very busy, these various channels and machines are blinking and beeping like an ambulance trying to cross a busy intersection at rush hour. In 2006, one study found that the average U.S. office worker was interrupted eleven times an hour. The cost of these interruptions, in which e-mail plays a large role, runs close to $600 billion in the United States alone.

We live in a culture in which doing everything all at once is admired and encouraged—have our spreadsheet open while we check e-mail, chin the phone into our shoulder, and accept notes from a passing office messenger. Our desk is Grand Central and we are the conductor, and it feels good. Why? If we're this busy, clearly we're needed; we have a purpose. We are essential. The Internet and e-mail have certainly created a "desire to be in the know, to not be left out, that ends up taking up a lot of our time"—at the expense of getting things done, said Mark Ellwood, the president of Pace Productivity, which studies how employees spend their time.

The evidence is in, though, and we can't multitask the way the technology we use at work leads us to believe we can. Our brains are what's telling us this. "Multitasking messes with the brain in several ways," Walter Kirn wrote in an essay called "The Autumn of the Multitaskers" in 2007. "At the most basic level,

the mental balancing acts that it requires—the constant switching and pivoting—energize regions of the brain that specialize in visual processing and physical coordination and simultaneously appear to shortchange some of the higher areas related to memory and learning."

A UCLA experiment bore this out. A group of twentysomethings were asked to sort a deck of cards—once in silence, a second time while listening to randomly selected sounds in search of specific tones. "The subjects' brains coped with the additional task by shifting responsibility from the hippocampus—which stores and recalls information—to the striatum," Kirn explained, "which takes care of rote, repetitive activities. Thanks to this switch, the subjects managed to sort the cards just as well with the musical distraction—but they had a much harder time remembering what, exactly, they'd been sorting once the experiment was over."

In other words, a work climate that revolves around multitasking and constant interruptions has narrowed our cognitive window down to a core, basic facility: rote, mechanical tasks. We like to think we are in control of our environment, that we act upon it and shape it to our needs. It works both ways, though; changes we make to the world can have unseen ramifications that impact our ability to live in it. And research is revealing that our use of technology has begun to alter our attention span; we've started reverse engineering our brains for speed, as opposed to mindfulness. It is perhaps for this reason—aside from its continuing cultural marginalization as an irrelevant art form—that poetry, despite being short and bite-sized, has not become a national pastime in the age of the Internet. As Donald Revell has pointed out, poetry is not about brevity or length but about attention, and "attention is a question of entirety, of being wholly present."

The longer we work this way, the harder it's going to be to do things that force us out of our reactive, dronelike existence, such as reading a novel or even a long magazine piece. "Immersing myself in a book or a lengthy article used to be easy," wrote Nicholas Carr in an essay entitled "Is Google Making Us Stupid?" "My mind would get caught up in the narrative or the turns of the argument, and I'd spend hours strolling through long stretches of prose. That's rarely the case anymore. Now my concentration often starts to drift after two or three pages. I get fidgety, lose the thread, begin looking for something else to do."

There's a reason for this: Reading and other meditative tasks are best performed in what psychologist Mihaly Csikszentmihalyi called a "state of flow," in which our focus narrows, the world seems to drop away, and we become less conscious of ourselves and more deeply immersed in ideas and language and complex thought. Many communication tools, however, actually inhibit this state. "Telephones and tape recorders, computers and fax machines are more efficient in conveying news," Csikszentmihalyi wrote in 1991, before e-mail had become as pervasive as all of these tools. "If only the point to writing were to *transmit* information, then it would deserve to become obsolete. But the point of writing is to *create* information, not to pass it along."

A whole new field of attention studies has emerged to capture the shift that has already occurred in how the brain works. One of the most intriguing recent findings in this area came from a Swedish cognitive scientist, Torkel Klingberg, who posited in *The Overflowing Brain* that there are roughly two types of attention: one a controlled, task-oriented kind, such as that required to crunch a spreadsheet; the other a stimulus-driven kind of attention, such as the way a car horn causes us to whip our heads around and prevents us, in most cases, from stepping

out into a busy street. Klingberg connects these two types of attention to two kinds of memory: short-term working memory and long-term memory.

The implications of this model on modern working life are enormous, as the greatest challenge presented by working in an environment of constant stimuli is maintaining focus, as well as keeping a lifeline to our working memory. One two-year study with children Klingberg cited showed that working at overload capacity does, in fact, improve working memory and possibly even problem-solving skills. Multitasking may not be perfect, but it can push the brain to add new capacity; the problem, however, remains that the small gains in capacity are continuously, rapidly outstripped by the speeding up and growing volume of incoming demands on our attention. The center, it turns out, just won't hold; so we create and push out into this world a kind of orienting capsule: ourselves.

The Digital Self: Introducing a Whole New You

No modern technology since the automobile has been more associated with our selves—the freedom to be, to explore, to augment and design ourselves—than the Internet. If you bought a plum-colored Dodge Charger in 1970, you were expressing, in a not very subtle way, that you were no shrinking violet. We now have a similar, much cheaper opportunity for transformation just by connecting to the Internet. Which "profile" do you want to use on your home PC? Which e-mail account? Do you want to be *AmyWilliams1972@yahoo.com*? Or would you rather be *surferchick1972@yahoo.com*? Depending on what circles this (fictional) Amy Williams traveled in, perhaps it would be bet-

ter to go as Amy.Williams1972@fas.harvard.edu—as long as she was actually, of course, an alumna of Harvard University.

Our addresses, in a simple way, say who we are and what we do, what we care about. They are a starting point of an interaction even more than a name since they can be chosen and manipulated. One study of 599 accounts in Germany showed that judgments made about people based solely on their e-mail addresses were ballpark correct and that observers made subtle distinctions from one address to another.

These addresses are just a very small signal—like the turning of leaves before a coming storm—of the enormous change brought about by the Internet with regard to our notions of a self. The rise of Internet-based communications, communities, and entire identities has become a fascinating way to watch people behave and negotiate their new, unhinged digital selves. The medium, as it turns out, isn't just the message; it's a hall of mirrors. In psychoanalytic terms, writes John Suler, a professor of psychology at Rider University, "computers and cyberspace may become a type of 'transitional space' that is an extension of the individual's intrapsychic world. It may be experienced as an intermediate zone between self and other that is part self and part other. As they read on their screen the e-mail, newsgroup, or chat message written by an internet comrade, some people feel as if their mind is merged or blended with that of the other."

What Rider is describing is called, in psychological terms, merger transference, and it starts, as I mentioned in the previous chapter, with the computer itself. Our computers have become extensions of ourselves—of our inner space—housing our personal letters and work and music and movies and most private financial information, sometimes all in one place. The visual cues that we have left our "desktop" and are now "out" on the

information highway when we launched a browser, though, are quite small; we still feel "in" there, inside our extended head. So it's extremely easy to feel as if somehow everything we do and everyone we interact with will play out inside us as well.

For those who struggle with this boundary, the computer and working via e-mail have made us, in a sense, narcissists. In his essay "On Narcissism," Sigmund Freud proposed two ideas of the narcissist: one revolved around the concept of self-love, the other stemmed from a state of mind that has no awareness that the self and other exist. Working over the computer and via the Internet, we have numerous cues that feed both instincts. Many of the most popular Web sites cater to our idea of selfhood and agency: MySpace.com; YouTube; YouPorn.com (don't laugh, it's routinely in the top thirty most visited sites in America).

Working over e-mail also reinforces this sense of being at the center of things—with a complicated caveat. The nature of the computing interface and the emotional attachment we forge to the machine make it harder and harder to remember that this voice, this text on the machine has come from outside of us. Suler explains that for some Internet users, "reading another person's message might be experienced as a voice within one's head, as if that person magically has been inserted or 'introjected' into one's psyche."

Thus, criticism that zings in over e-mail can feel like shouting; it can also flush out our deepest self-doubts and begin to sound more like an echo of ourselves than a comment from outside. We have several defenses against this—we can fire right back or flame, which I will discuss later. Or we can dissemble, improvise, or blend into the background. It used to be that clothes made the man, but for the hours we're on the Internet or typing to one another, that's not so. We can be whoever we want to be on a scale that's never before existed or been quite so easy.

Writing Our Way into Existence

Email allows me to indulge my new meditative technique: annihilation via impersonation. I answer each letter in my interlocutor's voice, and forty responses later I am no one and everyone.

—Don Paterson, *The Blind Eye*

In cyberspace I can change myself as easily as I change my clothes. Identity becomes infinitely plastic in a play of images that knows no end. Consistency is no longer a virtue but becomes a vice; integration is limitation. With everything always shifting, every one is no one.

—Mark Taylor and Esa Saarinen, "Shifting Subjects I"

What does it mean that you can have as many addresses on the Internet as you like, for free? That they will become an integral part of your daily life? One could argue that this isn't an entirely new development. Anonymous letters were an issue in the past, after all, and early writers frequently wrote under a pseudonym, as do some modern writers. Benjamin Franklin made his literary debut by slipping articles under his newspaper-publishing brother's door in the name of Silence Dogood; later on in life he published *Poor Richard's Almanack* under the name Richard Saunders. C. S. Lewis published poems under the name Clive Hamilton to protect his reputation as an Oxford don. The seventeenth-century Japanese poet Matsuo Kinsaku used fifteen different *haiga,* or pen names, before he settled simply on Basho, which was the name of a banana plant. Mary Ann Evans used a male pen name because she wanted her work to be treated seriously: we know her as George Eliot.

It's not an accident that all of these examples come from writers. Until the end of the twentieth century, they were the only people with the ability to put their thoughts into writing and have them distributed to a large and ready audience. One could write a letter to the newspaper and hope the editors printed it; bang away at a novel and send it off to a publisher and wait by the mailbox for a reply. But the vast majority of people wrote to communicate person to person, via letters and postcards and occasionally by telegram.

Now we can write for the world, or we can write to a friend. If both are posted on the Web in the form of a blog, perhaps the easiest way to publish ever created, it will be up to netizens' search habits as to whether either is read. Similarly, the forwardability of e-mail means that these intentions are easily blurred: an e-mail to a friend may, if clever or embarrassing enough, be read by hundreds of thousands of people. An e-mail to a large group may not be read by any of them.

The range of this possibility and the volume of text we're creating mean that more and more people are experiencing the metaphysical and stylistic dilemma once peculiar to writers. We write our way into being. Having different identities, different voices, different e-mail addresses—which is recommended if one wants to outrun spammers—gives us a degree of agency and control over the various online environments we visit. Disguised or obscured, we can fabricate; as our professional selves, we can do business. Using an e-mail address specifically to purchase items protects us from having our personal or work e-mail inboxes from being inundated with spam. As the Russian theorist Mikhail Bakhtin would point out, though, all these identities are unstable. The "I" that means "you" is a social construction just as much as surferchick1972.

The Internet has placed this fluidity in the most receptive

medium yet. Identity roulette has been part of the Web since its early days, when people logged on to Multi-User Dungeons (MUDs) in the 1970s to play an online textual version of Dungeons and Dragons. Chat rooms allowed people to be whoever they wanted to be—even though one of the first things asked of participants was "Morf" (male or female?) or, in other situations, "Sorg" (straight or gay?).

E-mail, as it became the primary screen-to-screen, person-to-person form of discourse, has domesticated this textual identity game. A study carried out on schoolchildren in Yorkshire, England, revealed that children learn this—and the need to represent it—immediately and take advantage of it. One of them took to using the signature "xxxxxxx—*Kavita*—xxxxxxxx." Asked later why, she responded, "I do that all the time . . . when I do my name on the computer and stuff. . . . I put my name like that cos it looks really neat and it looks boring just as a name."

We construct these identities visually and textually over e-mail because we can—but also because we must. As the volume of communication via e-mail increases, we need to differentiate ourselves, make our voices heard, cut through the noise. The prerogatives and seductions that once were the concern of writers, who had to keep us turning the pages, are now ours as correspondents. A distinctive voice is invaluable among friends and in business, just as it was in telling a story. "When you read a novel the voice is telling you a story; when you read a poem it's usually talking about what its owner is feeling; but neither the medium nor the message is the point," A. L. Alvarez writes in *The Writer's Voice.* "The point is that the voice is unlike any voice you have ever heard and it is speaking directly to you, communing with you in private, right in your ear, and in its own distinctive way." It's not just a matter of voice, though; research has shown that people imagine their lives in stories

and tend to live out their days in keeping with the narratives they tell. "The way people replay and recast memories," wrote Benedict Carey, "day by day, deepens and reshapes their larger life story."

The newly democratized narrative and authorial power granted by e-mail is an unprecedented freedom and responsibility compared to previous eras of communication. The Internet has created a situation where you can be many things at once and live behind as many false identities as you choose; creating such identities is even recommended to protect your privacy. "Never give your true identity when signing up for something online," Fred Davis, the founder and CEO of Lumeria, an Internet privacy firm, told a *San Francisco Chronicle* reporter. The writer later added, "Another way to mask your identity is to set up free e-mail accounts, like those available at a portal site (such as Yahoo or Excite) or at Hotmail, and use them in identifying yourself around the Web."

The practice is widespread. In 2006, a writer at the *Los Angeles Times* was suspended after it was discovered that he had been posting comments under fake names, Mikekoshi and Nofanofcablecos, on his blog and those of others. "Can a company that derives economic value from its reputation for literacy, judiciousness and taste comfortably lend its imprimatur to an unfiltered online diary?" the reporter wrote in his column and on the blog, skeptical from the beginning of the experiment in the new online form. "Blogs are by nature almost impossible to censor."

Events like this—and the ease with which one can fabricate new online identities for e-mail or blogging—makes trust over the Internet difficult to develop and easy to smash. This destructive cycle starts early, in school, where kids have always been picked on face-to-face. Now children have to suf-

fer in the virtual world, too. Sixty percent of cyberbullying is anonymous, and many times it comes from friends who know passwords and secrets. One of the most devastating examples occurred in Missouri. A thirteen-year-old named Megan Meier was contacted by a boy named Josh Evans online through the popular social networking site MySpace.com. "Mom! Mom! Look at him!" Meier said to her mother, pointing at his profile, which included the picture of a young, bare-chested boy with stylishly rumpled hair, asking permission to add him as a friend. Meier's mother said yes, and soon a friendship developed over MySpace messages, which are like Web-based e-mails. Meier had been depressed, and her spirits lifted. Here is how she described herself:

M is for Modern
E is for Enthusiastic
G is for Goofy
A is for Alluring
N is for Neglected.

Then, just as suddenly as Meier's neglect had ended, the messages from her new friend changed. Josh wrote, "I don't know if I want to be friends with you anymore because I've heard that you are not very nice to your friends." Other messages were blunter. Then postings appeared on bulletin boards: "Megan Meier is fat"; "Megan Meier is a slut." The final message was downright cruel: "Everybody in O'Fallon knows how you are. You are a bad person and everybody hates you. Have a shitty rest of your life. The world would be a better place without you."

On October 16, 2006, in a tailspin after this message, Meier hanged herself. She died the next day. Six weeks later, it turned out that "Josh Evans" was actually a forty-seven-year-old woman

named Lori Drew, the mother of a friend with whom Meier had lost touch after changing schools. Drew had apparently concocted the identity as a hoax and even laughed about it with other neighbors, enjoying the ability to "mess with Megan." In the fall of 2008, Drew was convicted of just three misdemeanor charges of accessing computers without authorization. The jury declined to convict her on a felony charge of accessing a computer without authorization to inflict emotional distress.

What Meier experienced, in an intimate, destructive, and deeply personal way, is an aggressive form of flaming—hostile or insulting communication over the Internet. It even continued after her death; a blog emerged after her death with postings claiming she'd had it coming. The anonymity afforded by the Internet has made it all too easy to criticize or roast someone publicly or right in their inbox. Like identity gymnastics, it's been with the Internet from the beginning. "Flame messages often use more brute force than is strictly necessary," writes Virginia Shea in *Netiquette,* "but that's half the fun." In other words, it's a game made for "teaching lessons" that often gets out of hand.

Trying to parse digs from duds, frenemies from simply frantic e-mailers, is a very difficult task in an environment so permeated with anonymity, speed, and lack of face-to-face interaction. Thinking too much about it can lead to a constant swirl of paranoia. Is it *me,* one wonders, or was that last message rude? The blogger "Elkins"—a pseudonym, by the way—astutely observed the mental self-questioning that takes place due to aggression among women on fan boards and the diabolical but very real possibility that this kind of abuse is meant to inspire such confusion, like Lori Drew "messing" with Megan Meier. Elkins's comment could apply to aggression in any form of computer-mediated conversation, however, including e-mail:

> There's definitely a "Gaslighting" effect to aggression which is so often denied: it serves to make the target doubt her own perception of reality. If it *seems* as if someone is trying to hurt you, but when confronted the person in question denies that this was at all the intent, then how do you respond? Whom do you trust? After all, you *could* have misinterpreted, or overreacted; and since it's quite often a purported "friend" aggressing against you in this fashion, you really wouldn't want to level a false accusation. Yet it's hard for the target of, say, an extended whispering campaign to avoid the conclusion that people really are out to get her because . . . well, because actually? They *are*.

As more and more people get connected, though, the Internet has become riddled with these ecological/emotional fires. Every interaction, it seems, has the potential to become a flame war. People's inability to understand tone in e-mails can lead to it; so can a bad day. There's another factor, however, that explains why people can be so rude to one another online over e-mail. We're all working in a medium that encourages disinhibition.

> *Flaming can be induced in some people with alarming ease. Consider an experiment, reported in 2002 in* The Journal of Language and Social Psychology, *in which pairs of college students—strangers—were put in separate booths to get to know each other better by exchanging messages in a simulated online chat room.*
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> *While coming and going into the lab, the students were well behaved. But the experimenter was stunned to see the messages*

> *many of the students sent. About 20 percent of the e-mail conversations immediately became outrageously lewd or simply rude.*
>
> —Daniel Goleman, *The New York Times*, 2007

Two financial consultants who don't know each other are corresponding over e-mail to set up a meeting. The woman signs off with her contact information, asking, "Is there anything else I can provide?" Her cohort, whom she has just "met," replies, "How about a picture?" A book editor receives an e-mail from someone he met once that begins "It's been a hard year for me" and ends with details of the writer's mental breakdown. A manager of artists e-mails a booker to say his singer cannot appear because she has fallen ill. Facing a hole in his schedule, the booker fires off an angry reply: "If she is sick, which I sincerely *doubt*, I wish her a speedy recovery, but let her know she has really put us out."

These are all examples of what psychologists call disinhibition—a filter drops, and we write things we probably wouldn't say to another in person, at least not after such a brief acquaintance. No environment induces it quite as easily as computer-mediated communication. Indeed, the PC may have extended the human mind, but it's missing a few key human circuits that modulate social interaction. Neurologists now know that many of the key mechanisms of communication reside in the prefrontal cortex of the human brain. "These circuits instantaneously monitor ourselves and the other person during a live interaction," wrote Daniel Goleman on www.edge.org, "and automatically guide our responses so they are appropriate and smooth." One of the key tasks of these circuits is inhibiting "impulses for actions that would be rude or simply inappropriate—or outright dangerous."

But awkward as it sometimes feels to be inside it, our body, as

it turns out, is the best, most sophisticated interface for appropriate communication. It has multiple valences; it has smell, touch, taste, and sight. It allows us to keep ourselves in check by providing real-time, continuous feedback from another person: facial expressions, the slightest twitch of an eyebrow, gestures, pauses, eye contact, the squeeze of an arm. Our bodies often embarrass us. "Man is the sole animal whose nudity offends his own companions," wrote Montaigne, "and the only one who, in his natural actions, withdraws and hides himself from his own kind."

The desire to transcend our fleshly envelope, to find a purer, more seamless form of talking and being is understandable—Emerson's transparent eyeball was in fact an extension of that wish. Communication technology, however, has been catering to that desire with increasing ability, from the telegram to the telephone, even if it is, in an idealized way, putting us right back into the *idea* of our bodies. It's a temporary relief, as we're discovering, sometimes not one at all. In Nicholson Baker's novel *Vox*, a man and a woman talk over a sex hotline. "I called tonight I think out of the same impulse," she says, "the idea that five or six men would hear me come, as if my voice was this *thing*, this disembodied body, out there, and as they moaned they would be overlaying their moans onto it, and, in a way, coming onto it, and the idea appealed to me, but then when I actually made the call, the reality of it was that the men were so irritating, either passive, wanting me to entertain them, or full of what-are-your-measurements questions, and so I was silent for a while, and then I heard your voice and I liked it."

There's a paradox here to this woman's experience on the chat line. The disinhibiting factors of the telephone that allow her to perform her own orgasm before a group of strangers for the same reason also work on the other participants on the line:

they can bark requests, relax in passivity, measure and assess nakedly and publicly, but without having to be seen. The same is true for written interactions over the Internet, but even more so. As Goleman says, "The Internet has no means to allow such realtime feedback (other than rarely used two-way audio/video streams). That puts our inhibitory circuitry at a loss—there is no signal to monitor from the other person. This results in disinhibition: impulse unleashed."

Another explanation of disinhibition leads back to the brain, having less to do with our "filters" and more with nuts-and-bolts functionality. One of the fastest-growing areas of neuroscience is the study of mirror neurons, highly active cells in our nervous system that, when we watch an action performed by another person, "fire," sending pulselike waves of voltage across cell membranes and creating the sensation that what we are watching is actually something we are doing or experiencing ourselves. Transcranial magnetic stimulation—the sending of low-voltage electric charges to parts of the brain to study its functionality—has confirmed this research.

The study of mirror neurons is still developing, but it is beginning to shed light on motor and language development, and also empathy. We may cry at the sight of a sad friend, screw up our face when we see someone react to a bad smell, or cringe when we see someone punched, because we are mirroring what she is experiencing. Research by the French-German neuroscientist Christian Keysers at the University of Groningen Social Brain Lab and others has shown that people who identify themselves as empathic on self-questionnaires have stronger mirror neuron activity.

The ramifications this research presents for communicating over e-mail are enormous. The visual absence of the person we are in exchange with deprives us of a deep-seated, physical iden-

tification with the actions and emotions of others. Marco Iacoboni, the author of *Mirroring People,* says the effects of this are writ large on the Internet: "The rudeness and aggressiveness over the internet—e-mails, blogs, Web forums, etc.—is likely due to the fact that people cannot look into each other's faces and cannot activate mirror neurons, thus cannot activate a very basic process of empathy for other human fellows."

Streams of invective trickle down message boards; comment queues of blogs are marinated in snark, with people blasting the host or one another with angry put-downs. Feedback sections of video-broadcasting sites, such as YouTube, are often a study of life without empathy. At the X Games in 2007, the skateboarder Jake Brown survived a horrifying four-story fall while attempting to land a 720—two-spin (rotation)—on a 293-foot half-pipe called the Mega Ramp. Brown completed the 720 but lost his skateboard on the final ramp, falling fifty feet to the ground and landing with such force his shoes exploded off his feet. For four agonizing minutes, he lay unconscious, potentially paralyzed or dying. "Ha ha ha ha ha ha," wrote one viewer in the comment queue of a YouTube posting of the video. "HIS SHOES POPPED OFF. LOL LOL," wrote another.

Brown ended up walking away from his spill—indeed, in July 2008 he made a successful return to the Mega Ramp—so clearly his hecklers weren't nearly as forceful as his internal willpower. But there are other instances in which disinhibited jeering from the sidelines can cause grave damage. Young kids, such as Megan Meier, who spend more time online than any other group, are in the line of fire of Internet-related disinhibition. A recent study conducted at a middle school in the United States revealed that 17 percent of the student body had experienced some form of cyberbullying, whether it was hostile and threatening e-mails, demeaning posts on Facebook or

MySpace, or videos or pictures posted on YouTube without their permission.

Children and teenagers, whose prefrontal cortexes are still developing, face increasing risks over the Internet, since they are just beginning to learn their inhibitions. "During adolescence there is a developmental lag," Goleman has written, "with teenagers having fragile inhibitory capacities, but fully ripe emotional impulsivity." This leads to flaming and even harassment of teachers. In 2007, Danielle McGuire, a teacher at the New York prep school Horace Mann, discovered that some students, who happened to be children of school trustees, had put up a page on Facebook entitled "McGuire Survivors 2006," portraying her as a witch and a liberal brainwasher. When she asked the school to deal with the situation, she was shocked to discover that the trustees wanted her disciplined for accessing their children's Facebook pages. After a school-wide disruption, the students were given a slap on the wrist and McGuire was later told the school would not be renewing her teaching contract.

Disinhibition also increasingly leads to sexual bravado. It used to be that teenagers passed notes in class; now, it seems, many of them are e-mailing or texting naked photos of themselves—or others—back and forth. In Santa Fe, Texas, school administrators confiscated dozens of mobile phones after naked pictures of two junior high girls began passing from inbox to inbox. The girls had sent their pictures to their boyfriends, who, like the boyfriend of Claire, who was made infamous for her joke about oral sex, passed them along. In Wisconsin, a seventeen-year-old was charged with child pornography after he posted naked photos of his sixteen-year-old ex-girlfriend on MySpace after she broke up with him. In some cases, naked photos of teenagers have wended their way back to parents.

There's an irony to this state of existence. The computer and e-mail were sold to us as tools of liberation, but they have actually inhibited our ability to conduct our lives mindfully, with the deliberation and consideration that are the hallmark of true agency. We react impulsively, quickly, and must face the consequences later. Our minds, augmented now by the largest, most usable database in the world, are hampered in basic functions such as showing kindness, restraint, and empathy. Digital believers will say that this is just the messiness of true democracy, that we all need to have thicker skins—that there are downsides to all change and the only thing we can count on is change, so adapt or be de-evolved from society.

But if we want to truly have power as individuals, we will preserve the right to push back on this electronic environment that has become such a key component of our day-to-day lives—to tinker with it and, if that doesn't work, resist its basic assumptions as best we can. In coming decades, we're going to have to think hard about whether we want to challenge the urgency, ubiquity, and Wild West quality of electronic communication—because doing so might mean shedding some of the trappings of this newly augmented, free-floating idea of ourselves in order to return to a life where things go a little more slowly.

DAWN OF THE MACHINES

In the ongoing television drama *Star Trek: The Next Generation,* one of the creepiest invasion threats comes from a race of cybernetics-enhanced aliens called the Borg. Zipped into bodysuits crenellated with wires and exposed electronics, their headsets gouging deep staplelike grooves into their humanoid flesh, they make a gruesome spectacle of a constantly connected life-form. The Borg—there is no singular—do not operate as individuals but as a hive, their minds plugged into a collective consciousness that they experience in their heads as thousands of voices speaking all at once. The Borg's goal is perfection, and they achieve it by adapting the biological and technological innovations of other species. "You will be assimilated," they state matter-of-factly upon encountering crew ships. "Resistance is futile."

It's hard to find a more potent metaphor for the dangers of the man-machine melding that we have experienced in the last fifty years. Science fiction may not always predict the future, but it is often a brilliant countermythology—a visible cultural symptom—of our prevailing anxieties. Is this the direction in which we are going or how we feel now? A collective society all talking inside one another's heads, in search of perfection, constantly plugged in? It's an extreme example, perhaps, but it's important for us to step back to look at the social implications