

## Is digital boom spelling cerebral doom?

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There was a time when we started and ended our day by looking at somebody we love. In today's digital world, for most of us, our day starts and ends with a gadget. Our brains are under the influence of an ever-expanding world of gadgetry: Hi-definition multichannel television, video games, internet, wireless networks, i-pads, Bluetooth links - the list is never ending. The current explosion of digital technology is not only changing the way we live and communicate but is rapidly and immensely altering our brain. Daily exposure to high technology and search engines like Google and Yahoo stimulates alteration of the neurons, gradually strengthening new neural circuits in our brain while weakening old ones. As we rely on the Internet and other forms of technology for almost everything from entertainment to political discussion to even social reform as well as communication with friends and co-workers, our brain are evolving at a speed like never before. Economic experts, though point to technology's positive impact on productivity and standard of living. The efficiency of the Web reduces the cost of transactions needed for producing and distributing many products and services. It's easier for consumers to shop for an item among many vendors, which allows for greater savings, choice, and shopping convenience. Routine transactions, such as making a mortgage payment or transmitting financial information, require less time and expense using Web-based technology.<sup>[1]</sup>

As the brain shifts its focus toward new technological skills, it drifts away from fundamental social skills, such as reading facial expressions during conversation or grasping the emotional context of a subtle gesture. A Stanford University study found that for every hour we spend on our computers, traditional face-to-face interaction time with other people drops by nearly thirty minutes.<sup>[2]</sup> With the weakening of the brain's neural circuitry controlling human contact, our social interactions may become awkward, and

we tend to misinterpret, and even miss subtle, non-verbal messages. In short, the modern digital world could well be altering our human identity. It is also interesting to note that just as evolution has programmed men and women to behave differently, there are differences even in the way they use and respond to technology, and a recent survey from the Pew Internet and American Life Project shows that women are more likely to email friends and family to share concerns, forward jokes, or plan events. They value the way the Internet enriches their relationships. Women tend to seek diet and health information on the Web and to worry more about criminal Internet threats. They are also more likely to download online map directions than are men. By contrast, men frequently log on to the Web for news and financial updates, sports scores, and video games. The study also showed that men tend to be more tech-savvy, more confident in using search engines, and more likely to try new gadgets and software.<sup>[3]</sup>

Today's young people in their teens and twenties, who have been dubbed Digital Natives (a term coined by the US writer Marc Prensky), have never known a world without computers, twenty-four-hour TV news, Internet, and cell phones. Many of these natives rarely enter a library, let alone look something up in a traditional encyclopedia; they use Google, Yahoo, and other online search engines.<sup>[4]</sup> It's almost as if something hasn't really happened until it's been posted on Facebook or YouTube. The neural networks in these brains differ dramatically from those of digital immigrants: people who came to the computer age as adults but whose basic brain wiring was laid down during a time when direct social interaction was the norm. Digital natives tend to have shorter attention spans, and this young high-tech generation often finds television too boring when simply watched on its own.<sup>[4]</sup> In 2006, a Los Angeles Times/Bloomberg poll gathered responses from 1,650 volunteers and found that the majority of teenagers were busy with

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other things while they were doing their homework: 84 percent of them listened to music while studying, 47 percent watched TV, and 21 percent were doing three or more tasks at once.<sup>[5]</sup> Today's digital revolution has drowned us into a state of continuous partial attention, continually staying busy—keeping track of everything while never fully focusing on anything. By paying partial continuous attention, people may place their brain in a heightened state of stress. They no longer have time to reflect, contemplate, or make thoughtful decisions. Many people who have been working on the Internet for several hours without a break report making frequent errors in their work. Upon logging off, they notice feeling spaced out, fatigued, irritable, and distracted. Eventually, the endless hours of digital connectivity can create a unique type of brain strain, which some authors have termed as techno-brain burnout.<sup>[6]</sup> There is also a feeling of superficiality about much online youth activism. Any teenager can choose to join a Facebook group supporting the campaign for girl child or the liberation of Tibet, but such engagement is likely to be shallow. A study by the Pew Research Center found that internet users aged 18-24 were the least likely of all age groups to e-mail a public official or make an online political donation. But when it came to using the web to share political news or join political causes on social networks, they were far ahead of everyone else. Rather than genuinely being more politically engaged, they may simply wish to broadcast their activism to their peers.<sup>[3]</sup>

There is a deeply divided brain gap between younger and older minds—in just one generation. The brain of the younger generation are digitally wired, often at the expense of neural circuits that control interpersonal and people skills. People of the older generation live in a world, in which their brains must adapt to high technology, or they will be left behind. Fewer young adults read books for pleasure now than in any generation before them. Since 1982, literary reading has declined by 28 percent in eighteen- to thirty-four-year-olds. Professor Thomas Patterson and colleagues at Harvard University reported that only 16 percent of adults aged eighteen to thirty read a daily newspaper, compared with 35 percent of those thirty-six and older. Patterson predicts that the future of news will be in the electronic digital media rather than the traditional print or television forms.<sup>[7]</sup>

## THE GOOGLE REVOLUTION

Did you know that Apple and Google are the top two brands in the world today, beating the likes of Coca Colas and Walmarts of the world!! Four years ago, Nicholas Carr, an American writer and 2011 Pulitzer prize finalist, wrote an essay for the Atlantic magazine titled “Is Google making us stupid?” which essentially summed up that human beings are uneducating themselves using these tools, and the rewiring of the human brain that ensues may deprive us of the talents

that ironically enough drove our evolution from caves to PC terminals. A recent study published in science suggests that Google is hampering our ability to recall information. Led by Betsy Sparrow at Columbia University, the study also found that Google improves certain kinds of memory, like methods for retrieving information. Search engines are rerouting our memory. According to Science, we are not necessarily losing our ability to remember things. Rather, the internet is changing the way we remember. People are recalling information less, and instead can remember where to find the information they have forgotten.<sup>[8]</sup>

## VIDEO GAME DELUGE

Whether video games are a boon or a bane has always been controversial. Neuroscientist Paul Kearney reported that some computer games can actually improve cognitive ability and multitasking skills. He found that volunteers who played the games eight hours each week improved multitasking skills by two and a half times.<sup>[9]</sup> Video games have become so popular that they are becoming a spectator sport in some parts of the world where Cyber athletes compete before crowds of a hundred thousand or more in South Korea in video game tournaments. In studies at Tokyo's Nihon University, Professor Akio Mori found evidence that video games appear to suppress frontal lobe activity. Chronic players those who play two to seven hours each day sometimes develop video game– brain, a syndrome that essentially turns off the frontal lobes, even when the kids are not playing video games.<sup>[10]</sup> Players tend to get wrapped up in the video game, forgetting or ignoring what else is going on around them. The player's increased physical and psychological arousal frequently leaves them feeling tense and irritable. Video gaming has been found to increase blood pressure and heart rate and to stir up the body's autonomic nervous system. Previous research has shown that extensive video gaming makes kids more aggressive and desensitizes them to violence they see elsewhere. However, recent investigations suggest that the intensity of a game's violent graphics, rather than the amount of violent content, may have a greater effect on brain function and aggressive behavior. We do know that a limited amount of video gaming may enrich minds and improve some forms of cognitive performance while too much can lead people to become spaced and unresponsive to the real world around them.

## INTERNET ADDICTION

Internet addicts report feeling a pleasurable mood burst or “rush” from simply booting up their computer, let alone visiting their favorite websites—just as shopping addicts get a thrill from gazing at sale ads, putting their credit cards in their wallets, and setting out on a spending spree. A recent Stanford University study found that up to 14 percent of computer users reported neglecting school, work, family,

food, and sleep in order to remain online.<sup>[11]</sup> Compulsive users report feeling a sense of liberation and anonymity online, so they often say or write things they might not otherwise reveal about their personal lives. Some users get a thrill from making up completely false personalities. Internet addicts typically spend forty or more hours each week online in addition to online work time, which leaves approximately four to five hours a night for sleep before a person hops back on the computer. Most addicts lie about it to others and tend to get defensive when family and friends question the amount of time they spend online. These addicts routinely experience apathy, depression, anxiety, restlessness, fatigue, irritability, and clouded thinking.<sup>[12]</sup>

Constantly checking their inbox for emails on a phone or on a computer is another disturbing behavior, which many of us are getting hooked on to. Though the inbox is usually either exactly how one had left it, or newly joined by something that could easily have waited—for some reason, this never seems to register, and I must admit, I am one of this tribe. Part of what makes email so addictive is that it follows the rules of operant conditioning, which means that the behavior is shaped by its consequences. When you check email, you get intermittent positive responses like the arrival of an old friend in town, a great joke, or rarely news of winning an online lottery. But more often, a neutral, boring, or distressing mail notice or spam gets through. You can never tell in advance whether checking your email will be pleasurable or not, so you keep on checking, checking, and checking. Behavioral psychologists have detailed how the principles of reward and punishment reinforce this behavior, and they have found that using consistent rewards—good news all the time—is less motivational than randomly occurring rewards.<sup>[12]</sup> Addiction to online pornography is another difficult menace to cope with. Although only 4 percent of websites display sexually-related material, at least one-third of Internet users engage in some type of online sexual activity.<sup>[13]</sup> Some people simply email sexually explicit jokes or humorous images; others find the accessibility, affordability, and anonymity of more intense cyber sex irresistible. Dr. Amanda Spink at Pennsylvania State University analyzed patterns of Web searching for sexual information. They found that sexually related search sessions were usually longer and contained more queries, compared with non-sexual sessions: Nearly 40 percent of sexually related query sessions lasted longer than six minutes, compared with only 22 percent of non-sexual queries that continued for that length. Sexual queries also involved simple keyword searches using such generic terms as nude, sex, and naked, whereas non-sexual queries used more complex and varied language.<sup>[14]</sup> The accessibility and anonymity of the Web, both at home and at work, help make it particularly tough for sex addicts to abstain.

## CONCLUSION

We are in the times when conversations at dinner table resemble instant messages, whereby family members pop in with comments that have no linear theme. In fact, if there is time to have a family meal, some family members tend to eat and run back to their own computers, video games, cell phones, or other gizmos. Whoever said gadgets and widgets reduce our work load should think again, as we seem to be becoming busier in this digital world. As much as new technology has brought us remarkable advances, the challenge is to take advantage of the technology without letting it take over our identity. Internet's onslaught and deluge of information has given rise to "cursory reading, hurried and distracted thinking, and superficial learning" – in contrast to the age of the book when intelligent humans were encouraged to be contemplative and imaginative.<sup>[15]</sup> During this critical point in brain evolution, we don't all have to become techno savvy, nor do we need to trash our computers. Instead, we all should adapt and succeed in this Hi-tech environment. Our objective should be to ensure that the current generations of children don't give up on interpersonal skills and human values, at the cost of digital intelligence. Thankfully, to date, there is no gadget that could replace treasured human emotions like love and warmth and the creative intuitions that we are gifted with. But only time will tell if we will be in control of the technology that we constantly indulge in or become enslaved by it.

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