

3-2012

The Multitasking Monster

Lynn Holding
Dickinson College

Follow this and additional works at: http://scholar.dickinson.edu/faculty_publications



Part of the [Music Performance Commons](#)

Recommended Citation

Holding, Lynn. "The Multitasking Monster." *Mindful Voice. Journal of Singing* 68, no. 4 (2012): 451-55.

This article is brought to you for free and open access by Dickinson Scholar. It has been accepted for inclusion by an authorized administrator. For more information, please contact scholar@dickinson.edu.

The Multitasking Monster

Lynn Holding



Lynn Holding

THIS ARTICLE IS THE THIRD INSTALLMENT of a series loosely grouped under the rubric “Teaching and Learning in the Digital Age,” in which I have considered the effects of digital technology on both teaching and learning.¹ In order to understand these effects, it was necessary to give an overview of the complex learning process itself, which I explained as a triumvirate of attention, memory, and learning.² While each of these three abilities possesses singular qualities that can be parsed from the whole and examined separately, they are deeply intertwined. Thus, when one part of the learning triumvirate is compromised, the entire learning journey suffers. And while no one of these components is individually more important than the other two, the attribute of attention must be accorded special recognition as the gatekeeper to learning and memory.

The neural substrate of learning, that is, forming (“firing”) and keeping (“wiring”) new connections between brain cells, depends upon the act of attention as new input is being received by the learner. Learning cannot happen until a person first “attends”—and in the neuroscience of attention, to “attend” means more than just showing up. Within the triumvirate of attention/learning/memory, the attribute of attention must get first dibs, for attention is the prerequisite condition upon which the dynamic dance between memory and learning depends.³

In this column, I will consider the most current challenge to our notoriously fragile human attention spans, and one that is uniquely associated with the digital age: “multitasking.”

MULTITASKING

The term “multitasking” first appeared in the nascent computer technology of the 1960s, but since the advent of the worldwide web in the 1990s, the word was absorbed into the popular lexicon. While multitasking *per se* has been a part of human activity for millennia (think of hunter-gatherer cultures in which a mother forages for food while simultaneously caring for an infant strapped to her back), the current manifestation of the term “multitasking” specifically signifies the mingling of technology-based tasks: reading email while listening to music, texting while watching television, driving a car while following a GPS and talking on a cell phone—or tweeting comments through a smart phone while attending a concert. As a leading researcher in multitasking describes it,

Multitasking as we’re studying it here involves looking at multiple media at the same time. So we’re not talking about people watching the kids and cooking and stuff like that. We’re talking about using information [from] multiple sources.⁴

Journal of Singing, March/April 2012
Volume 68, No. 4, pp. 451–455
Copyright © 2012
National Association of Teachers of Singing

Regarding media multitasking among adults, one study estimated that almost one quarter of media use (23.7%) is spent with more than one medium.⁵ But it is the habit of “media multitasking” among the young—the “Digital Natives”—that has sparked intense concern, raised questions, and inspired the most research on the topic. The Kaiser Family Foundation recently released the third in a series of large-scale, nationally representative surveys concerning media use among young Americans.⁶ It includes data from all three waves of the study (1999, 2004, and 2009), and is among the largest and most comprehensive publicly available sources of information about media use among American youth.

8–18 year-olds devote an average of 7 hours and 38 minutes (7:38) to using entertainment media across a typical day (more than 53 hours a week). And because they spend so much of that time “media multitasking” (using more than one medium at a time), they actually manage to pack a total of 10 hours and 45 minutes (10:45) worth of media content into those 7½ hours.

The amount of time spent with media increased by an hour and seventeen minutes a day over the past five years, from 6:21 in 2004 to 7:38 today. And because of media multitasking, the total amount of media content consumed during that period has increased from 8:33 in 2004 to 10:45 today.⁷

It appears that members of the tribe of Digital Natives (those who were born into the Digital Age) constitute the demographic that is most engaged in multitasking, most certain of its efficiency, and most confident of its ability to flit between tasks with no decrement to learning. In the words of Lauren, a student at Massachusetts Institute of Technology,

I feel like the professors here [at MIT] do have to accept that we can multitask very well, and that we do at all times. And so if they try and, you know, restrict us from doing it, it's almost unfair because we are completely capable, moving in between lecture and other things and just keeping track of the many things that are going on in our lives.⁸

Clifford Nass, a communications professor and cognitive researcher at Stanford University, conducted some of the very first studies of multitaskers that were designed to challenge assumptions like Lauren's. The news from those studies is, to quote an adjective that Nass uttered seven times in just one interview, “scary.”⁹

Nass's team set up two related experiments, identifying and choosing as their subjects so-called “high multitaskers,” that is, students who “are doing five, six

or more things at once, all the time.”¹⁰ The first experiment attempted to answer whether multitaskers can focus and not become distracted, and the second considered the efficacy with which multitaskers shift from one task to another.

It is significant to note that at the outset, the three members of the Stanford research team all believed that their subjects would show themselves to be “stars at something,” be it “filtering” (the term for ignoring irrelevant information), shifting from one task to another, or keeping their respective memories' organized. Their findings?

We were absolutely shocked. We all lost our bets. It turns out multitaskers are terrible at every aspect of multitasking. They're terrible at ignoring irrelevant information; they're terrible at keeping information in their head nicely and neatly organized; and they're terrible at switching from one task to another.¹¹

Contrasted with their findings were the self-assessments of multitaskers, who, like MIT student Lauren, “virtually all think they are brilliant at multitasking.”¹² But Nass has news for Lauren and all chronic multitaskers.

One of the big discoveries is, you know what? You're really lousy at it! And even though I'm at the university and tell my students this, they say: “Oh, yeah, yeah. But not me! I can handle it. I can manage all these [tasks].”¹³

Further experiments that Nass and other researchers are conducting on the effects of multitasking are revealing several significant and unsettling findings. Regarding learning itself, study subjects demonstrate decrements in their ability to engage in higher levels of thinking (like analytic reasoning). Researchers at UCLA who published a study on multitasking stated flatly that multitasking “adversely affects how you learn,” and found that even if one actually learns something (anything) while multitasking, the learned thing “is less flexible and more specialized, so you cannot retrieve the information as easily.”¹⁴

In health terms, multitasking subjects evince increased levels of stress hormones. The stress-response system is activated in the multitasker for at least two reasons: first, by his antagonistic struggle to keep tasks separated and categorized in his mind, while simultaneously allowing the multitasking rototiller to churn them up together; second, by the phenomenon known as “task switch loss.” This is the elapsed time lost when switching between two tasks, which is, of course, ironic, considering that mul-

titasking is supposed to actually increase productivity. Essayist Walter Kirn sardonically describes this conflation of inefficiency and anxiety as “concentrat[ing] on the act of concentration at the expense of whatever it is that we’re supposed to be concentrating on.”¹⁵

The overactivation of the stress-response system can put one at an increased risk for a host of health problems (heart disease, insomnia, digestive problems, depression, obesity, skin problems), but the most detrimental to learning is memory impairment. Stress releases steroid hormones in the body called “glucocorticoids,” which, among other evils visited upon our vital organs, have recently been linked to the death of brain cells.¹⁶ Since memory is a key component in the attention-learning-memory triumvirate, Nass’s apocalyptic view of multitasking seems far from hyperbolic.

Multitasking is one of the most dominant trends in the use of media, so we could be essentially dumbing down the world . . . It’s a scary, scary thought.¹⁷

THE BRAIN ON SINGING

So what does all this mean for singing? According to the UCLA study lead researcher, “Tasks that require more attention, such as learning calculus or reading Shakespeare, will be particularly adversely affected by multi-tasking.”¹⁸ The fact that singing is a complex activity that requires our full attention may go without saying among singers; but from a neurological perspective, the reason it requires full attention is because singing uses so much of our mental real estate.

The concept of *brain lateralization* (that is, the specialization of function between the left and right hemispheres of the brain) was quick to leap the confines of academic brain science and ignite the popular imagination in the 1970s. Soon, artists and creative thinkers were self-identifying as “right brain thinkers,” while lawyers, engineers and statisticians were labeled “left brain dominant.” Even though neuroscientists caution that this concept is oversimplified (both sides of the brain contribute to both analysis and abstract thinking), there is still some merit to this line of understanding how the brain functions.

In music, the processing of basic musical information is largely situated in the right hemisphere of the brain. Yet the components of Western music (rhythm, melody, harmony, and so on), and what Daniel Levitin,

Director of the Laboratory for Music Perception, Cognition, and Expertise at McGill University calls “the naming aspects of music” (naming a song, specific performer, or instrument), are learned parameters that are largely processed in the left hemisphere.¹⁹

Musicians who master Western classical music must learn to nimbly toggle between both hemispheres of the brain, and it is these brain gymnastics that are thought to provide some answers as to why researchers at Harvard University have made some intriguing discoveries about musicians’ brains. Not only did they see that the brains of musicians are generally larger than the average population,²⁰ but the *corpus callosum* (the main band of fibers that connect both sides of the brain) are also larger and more fibrous in musicians than nonmusicians.²¹

Yet singers have the added charge of language, which involves correct pronunciation, natural inflection, clear diction, and genuine comprehension in as many as four different languages beside one’s own. As if these challenges weren’t enough, there is also the matter of technique, that singular knowledge possessed by the teacher, bequeathed to the student in the voice lesson, and honed by the student singer in the practice room.

The best thing you can do to improve your memory is to pay attention to the things you want to remember . . . Our data support that. When distractions force you to pay less attention to what you are doing, you don’t learn as well as if you had paid full attention.²⁰

The sheer obviousness of that statement would seem to render it an unnecessary admonition. But the ability of multitasking to shatter attention into unusable shards, and its subsequent effects on learning, don’t seem enough to dislodge us from our current multitasking habits, nor from our collective belief in the harmlessness of it. In fact, the ubiquity of multitasking renders it practically invisible as a vector for the many ills listed here, and almost certainly would not be blamed for lackluster vocal performance. Such was the case when what Kirn called “the monster of multitasking” slid into my studio, undetected.²¹

Consider the following true story of one of my former students. Her time in my studio coincided with the rise of the Smartphone, a gadget that she was among the first to acquire. Smartphone Soprano was possessed of a lustrous voice and a radiant, if somewhat reluctant, stage presence. Because of a natural shyness, she had some challenges ahead of her as a soprano intent on a

singing career. But she worked hard, and by the end of her second spring semester, truly exceptional technical accomplishments in lesson after lesson were her norm. The following autumn, however, she was literally singing a different tune, and by early winter, both of us were genuinely mystified over her spectacular lack of progress. She made more than one appointment, outside of lesson time, to reflect on her apparent stagnation, and even considered dropping the voice major. During one of these soul-searching sessions, her cell phone rang. As she fumbled to switch it off, I was suddenly inspired with a theory. “Do you take your cell phone with you into the practice room?” I asked. Her answer: “Yes.” “Is it silenced, or always on?” (answer: “On”), “And do you talk or text during practice sessions?” (“Yes” and “Yes”).

Together, Smartphone Soprano and I tallied up the average number of calls and texts she typically made during a routine practice session, and revealed that her one-hour practice sessions were interrupted, on average, seven times, or approximately every eight and a half minutes. Interestingly, these numbers correspond almost exactly to a recent study on the texting habits of the average American teenaged female, who sends and receives an average of 4,050 “texts” per month—which breaks down to 135 text messages per day, or more than nine per every hour she is awake.²²

We considered the “task switch cost” in the yo-yo shift from focused concentration on singing, to texting the boyfriend, back to singing, then texting a dinner invitation, and so on, every seven minutes for an hour. When combined with the hampered retrieval of information effect, as described in the UCLA study, we had cornered the culprit for her mysterious stagnation.

The ending to the story of Smartphone Soprano is a simple one: she switched her phone off while practicing, and the positive effect, as revealed in boosted performance, was almost immediate. Now contained in both in my syllabus and my verbal lesson directives are admonitions to “not merely silence, but turn off” the gadgets while practicing. Common sense says that we should; current brain science explains *why* we should—if we care at all about learning.

CREATIVE SPACE NEEDED

The previous two decades have ushered in an onslaught of new digital media, the wonders of which are incon-

trovertible. For musicians, the once cumbersome and expensive aspects of self-management (recording, printing, and networking) have all been utterly transformed by digital media. For students and teachers of singing, video and audio recording of lessons and master classes is a snap, and these data files can be instantly posted and shared.

The concerns raised in the previous three installments of “Mindful Voice” were not aimed at digital media *en masse*. Rather, the effects of digital media on learning in general must be soberly considered. Since attention is the prerequisite condition to learning (no learning can happen unless a person first “attends”), the decrements to attention that are being studied and tallied in research labs across the globe ought to give us pause. We are now, in the words of Sherry Turkle, director of the Massachusetts Institute of Technology’s “Initiative on Technology and Self,” “well past the time to take the measure of what the costs are.”²³

In a previous article on creativity, I took issue with the theory that there is a “creativity crisis” and argued that the real crisis is the lack of the fundamental requirements for creative thought, namely, time and mental space.²⁴ The assault on these two attributes is certainly not unique to the digital age; time and mental space are continually imperiled by the human condition. After all, how can deep thoughts, new inventions, or great art be produced when the creator is sick, enslaved, or just uncertain about the source of his or her next meal? But the aptly named “screen invasion” has accomplished just such an attack: when we allow them to, our screen-based technology breaches the walls of our minds and fills every available nook and cranny with the good (information), the bad (online gambling), the convenient (online banking), and the puerile (gossip), at increasingly obvious costs to our mental clarity, our ability to learn, our relationships, our physical health, our finances, our careers—in short, the very things that the digital revolution promised to enrich.

There are certain intellectual pursuits, like deep reading, or interpreting a Schumann song set to a poem of Heine, that take time. There are certain physical pursuits, like learning to sing a scale in tune, or manage breath efficiently enough to sing Bach, that take time and singular attention, that “demand attention to things that are long and woven and complicated.”²⁵ And if the

pursuit of these activities demands time and attention, so are time and attention required to experience them. Are not these the very attributes that we assume an audience brings into the theater or concert hall every time we or our students attempt to share the fruits of our artistic labors?

Time and attention are antithetical to the monster of multitasking, which feeds on as many connections as our minds can handle. That technology has made feeding this beast breathtakingly easy is indisputable. But as Turkle noted in a recent interview, “What technology makes easy is not always what nurtures the human spirit.”²⁶ And what nurtures us is not always easily attained. Such things demand our undivided attention.

NOTES

1. Lynn Holding, “Digital Natives and Digital Immigrants: Teaching and Learning in the Digital Age,” *Journal of Singing* 68, no. 2 (November/December 2011): 199–206.
2. Lynn Holding, “Choosing Attention,” *Journal of Singing* 68, no. 3 (January/February 2012): 321–327.
3. *Ibid.*, 324.
4. Clifford Nass, interview conducted on February 2, 2010 for PBS *Frontline* documentary film, “Digital Nation”; www.pbs.org/wgbh/pages/frontline/digitalnation/interviews/nass.html (accessed September 17, 2011).
5. Robert A. Papper, Michael E. Holmes, and Mark N. Popovich, “Middletown Media Studies: Media Multitasking . . . and How Much People Really Use the Media,” *The International Digital Media and Arts Association Journal* 1, no. 1 (2004): 5–50.
6. Victoria J. Rideout, Ulla G. Foehr, and Donald F. Roberts, “Generation M2: Media in the Lives of 8- to 18-Year-Olds Generation,” *Kaiser Family Foundation Study* (January 2010): 2–5.
7. Kaiser Family Foundation news release; www.kff.org/entmedia/entmedia012010nr.cfm*Ibid* (accessed November 1, 2011).
8. Transcript, PBS *Frontline* documentary film, “Digital Nation”; <http://www.pbs.org/wgbh/pages/frontline/digitalnation/etc/script.html> (accessed September 17, 2011).
9. Nass.
10. *Ibid.*
11. *Ibid.*
12. *Ibid.*
13. *Ibid.*
14. University of California—Los Angeles, “Multi-tasking Adversely Affects Brain’s Learning, UCLA Psychologists Report,” *ScienceDaily* (July 26, 2006); <http://www.sciencedaily.com/releases/2006/07/060726083302.htm> (accessed November 1, 2011).
15. Walter Kirn, “The Autumn of the Multitaskers,” *The Atlantic* (November, 2007); <http://www.theatlantic.com/magazine/print/2007/11/the-autumn-of-the-multitaskers> (accessed Feb 1, 2011).
16. Jonah Lehrer, “The Reinvention of the Self,” *SEED-MAGAZINE.COM* (March 3, 2011); seedmagazine.com/content/print/the_reinvention_of_the_self/ (accessed August 3, 2011).
17. Nass.
18. University of California—Los Angeles, “Multi-tasking Adversely Affects Brain’s Learning.”
19. Daniel J. Levitin, *This Is Your Brain on Music: The Science of a Human Obsession* (New York: Dutton/Penguin 2006), 125.
20. Christian Gaser and Gottfried Schlaug, “Brain Structures Differ Between Musicians and Non-Musicians,” *The Journal of Neuroscience* 23, no. 27 (October 8, 2003): 9240–9245.
21. D. J. Lee, Y. Chen, and G. Schlaug, “Corpus Callosum: Musician and Gender Effects,” *Neuroreport* 14, no. 2 (February 2003): 205–209.
20. Russell Poldrack, <http://www.psych.ucla.edu/news/russell-poldrack-multi-tasking-adversely-affects-the-brains-learning-systems> (accessed August 3, 2011).
21. Kirn, 4.
22. U.S. Teen Mobile Report: “Calling Yesterday, Texting Today, Using Apps Tomorrow,” *Nielsen Wire*; http://blog.nielsen.com/nielsenwire/online_mobile/u-s-teen-mobile-report-calling-yesterday-texting-today-using-apps-tomorrow, October 14, 2010. (accessed July 12, 2011).
23. Sherry Turkle, interview conducted on Sept. 22, 2009 for PBS *Frontline* documentary film, “Digital Nation”; [www.pbs.org/wgbh/pages/frontline/digitalnation/interviews/turkle.html #4](http://www.pbs.org/wgbh/pages/frontline/digitalnation/interviews/turkle.html#4) (accessed February 5, 2011).
24. Lynn Holding, “Creativity in Crisis?” *Journal of Singing* 67, no. 5 (May/June 2011): 597–604.
25. Turkle, “Digital Nation.”
26. *Ibid.*

Copyright of Journal of Singing is the property of National Association of Teachers of Singing, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.