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# You Have Too Much Mail

*Our brains, overloaded and distracted now, evolved in a simpler environment.*

By **CHRISTOPHER F. CHABRIS**

Take a look at your computer screen and the surface of your desk: A lot is going on. Right now, I count 10 running programs with 13 windows on my iMac, plus seven notes or documents on my computer desk and innumerable paper piles, folders and books on my "main" desk, which serves primarily as overflow space. My 13 computer windows include four for my Internet browser, itself showing tabs for 15 separate Web pages. The tasks in progress, in addition to writing this review (what was that deadline again?), include monitoring three email accounts, keeping up with my Facebook friends, figuring out how to wire money into one of my bank accounts, digging into several scientific articles about genes, checking the weather in the city I will be visiting next week and reading various blogs, some of which are actually work-related. And this is at home. At the office, my efforts to juggle these tasks would be further burdened by meetings to attend, conference calls to join, classes to teach and co-workers to see. And there is still the telephone call or two -- on one of my three phone lines (home, office, mobile).

A century ago, time and motion studies were conducted to understand precisely how various tasks of physical labor were carried out and how they could be done more efficiently. The results were revealing: What a bricklayer did in 18 steps, it turned out, could be done in just five. Torkel Klingberg begins "The Overflowing Brain" with a sort of "time and attention" study: an eye-opening vignette of a day in the mental life of a typical corporate manager. Mere minutes or seconds after beginning one task, she is interrupted by another; she spends the first 90 minutes of her day reading and sending email and devotes as much time thereafter to updating and re-ordering items on her to-do lists than to actually getting things done.

How did we arrive at this point? Obviously advances in technology have played a big part, pooling information, disseminating it easily and offering the means to interrupt nearly every task before it is finished. Economists argue that, by increasing productivity, technology drives economic growth. Perhaps so, but it also changes the rhythms of life, giving us more things to pay attention to and thinner slices of time to devote to each one. "Information overload," a term coined by the futurist Alvin Toffler in 1970, is now a chronic condition. Some people fight back, claiming that they are good at "multitasking" and actually prefer it to focusing on one task at a time.

Don't believe them. Our brains evolved in a far simpler environment. Like a Model T at the Indianapolis Motor Speedway, they poke along, doing what they can, but they have trouble keeping up at current speeds. Mr. Klingberg, a cognitive neuroscientist in Stockholm, gives us a brief tour of what science has discovered about our brains, especially what their limits are and what we can do to improve their functioning.

When we must return to a task after interruption or delay, our brain's *working memory* tries to retain the necessary information. We use this form of memory, say, to keep a telephone number in mind just long enough to dial it. But working memory has a short life and limited capacity. About four items is the most it can hold. If we start a conversation before we dial the phone number, the number will disappear.

Working memory is so fugitive in part because it is encoded in the *activity* of brain cells. As we try to remember a new phone number, neurons in our frontal and parietal lobes are firing away. (By contrast, the long-term memory of, say, where we last parked our car is encoded in the *strength* and *topography* of connections between neurons in the occipital and temporal lobes.) Attention works the same way: Neurons increase their activity as we concentrate on an object or task, and they slow their firing when something else intervenes. It is true that the brain can accomplish many things at once (we can drink coffee and listen for a train station to be announced while we read the morning paper), but it can only pay careful attention to one at a time. Indeed, attention is so precious that it is easily depleted -- even when the added task (such as talking on a cellphone) superficially seems to be completely independent of the primary one (driving a car).

For Mr. Klingberg, the mismatch between our modern lives and ancient brains is most evident in the problems of working memory and attention, but another culprit may be at work. We are easily distracted also because we vastly overvalue what happens to us *right now* compared with what comes in the future and because novelty is intrinsically rewarding. So whatever we are supposed to be focusing on has to compete with every new email, new task, new blog post and new conversation that wanders into our information sphere. These biases may have served us well in our species' evolutionary past, when the future was uncertain and the new could well be a threat that deserved immediate attention. But nowadays the new is more often trivial than essential, and sacrificing immediate rewards can yield greater ones in the future.

What to do? Mr. Klingberg details how he and other brain researchers are trying to find ways to increase mental capacity. Many doctors already recommend various brain-boosting activities, from crossword puzzles to aerobic exercise, for staving off Alzheimer's disease. Nintendo's "Brain Age" games claim to improve the brain with various puzzle-tasks. Although some claims have notoriously failed to hold up (research showed that listening to Mozart's music would not in fact increase IQ), the field is young, and there is no reason to believe that the inherent plasticity of the brain cannot be stretched further. It is hard to say, though, whether it will ever stretch far enough to manage the email that has built

up in my inbox since I started writing this review.

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