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The Organized Mind: How to better structure our time in the age of social media and constant distraction.

The information age is drowning us in a deluge of data, and it is becoming increasingly difficult to separate facts from pseudo-facts, objective from biased sources, and at the same time, we're all being asked to do more at home and at work. **Daniel Levitin** *reviews the cognitive neuroscience of attention and memory, presents the differences between mind-wandering mode and task-focused mode and offers advice for how to boost creativity and limit exhausting brain-shifting distractions.*

The human brain evolved to focus on one thing at a time. This enabled our ancestors to hunt animals, to create and fashion tools, and to protect their clan from predators or invading neighbours. In parallel, an attentional filter evolved to help us to stay on task, letting through only information that was important enough t deserve disrupting our train of thought. This filter, discovered by British scientists Neville Moray, Donald Broadbent and Anne Treisman in the 1960s, is what captures your attention when you hear someone mention your name in a crowded room; it monitors input in order to deliver some events to consciousness and ignore others. This attentional system is one of the crowning achievements of the human brain, and the focus it enables allowed us to harness fire, build the pyramids, discover penicillin and decode the entire human genome.

But a funny thing happened on the way to the twenty-first century: The plethora of information and the technologies that serve our brain changed the way we use it. Increasingly, we demand that our attentional system try to focus on several things at once. Multitasking is the enemy of a focused attentional system. We talk on the phone while we're driving, listening to the radio, looking for a parking place, mentally planning our mom's birthday party, trying to avoid the road construction signs, and thinking about what's for lunch. We can't truly think about or attend to all these things at once, so our brains flit from one to the other, each time with a neurobiological cost. Once on a task, our brains function best if we stick to it. To pay attention to one thing means that we *don't* pay attention to something else. Attention is a limited-capacity resource.

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Uni-tasking is getting harder and harder to do. The information age now buries us in data coming at us from every which way. We are bombarded with more information than at any time in history — the equivalent of 175 newspapers a day, five times as much information as we took in thirty years ago. This deluge of facts, pseudo-facts, newsfeeds, and jibber-jabber tricks our attentional system because it is *new* and our attentional system evolved to be sensitive to novelty, to habituate to anything old. That's why you barely notice the hum of your old refrigerator until a friend walks in and points it out.

And then there are times we just zone out, staring out the window, looking at nothing in particular. In this state, thoughts seem to move seamlessly from one to another. There's a merging of ideas, visual images, and sounds, of past, present, and future. Thoughts are loosely connected, a stream-of-consciousness so much like the nighttime dream state that we call them daydreams.

This daydreaming mode constitutes a distinctive and special brain state of great creativity. It exerts a pull on consciousness; it eagerly shifts the brain into mind-wandering when you're not engaged in a task, and it hijacks your consciousness if the task you're doing gets boring. It has taken over when you find you've been reading several pages in a book (or blog post!) without registering their content, or when you are driving on a long stretch of highway and suddenly realize you haven't been paying attention to where you are and you missed your exit. It's the same part that took over when you realized that you had your keys in your hand a minute ago but now you don't know where they are.

Daydreaming or mind-wandering, we now know, is a natural state of the brain. This accounts for why we feel so refreshed after it, and why vacations and naps can be so restorative. The tendency for this system to take over is so powerful that its called the *default mode*. This mode is a resting brain state, when your brain is not engaged in a purposeful task, when you're sitting on a sandy beach or relaxing in your easy chair with a single malt Scotch (Glenfarclas, neat, please), and your mind wanders fluidly from topic to topic. It's not just that you *can't* hold on to any one thought from the rolling stream, it's that no single thought is demanding a response.

The mind-wandering mode stands in stark contrast to the state you're in when you're intensely focused on a task; it is responsible for so many high-level things we do that researchers have named that "the central executive." These two brain states form a kind of see-saw. When one is up (in terms of neural activation) the other is not; if we're in one mode we're not in the other. The job of the central executive is to prevent you from being distracted when you're engaged in a task, limiting what will enter your consciousness so that you can focus on what you're doing uninterrupted.

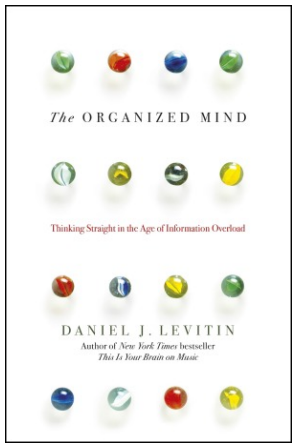
The mind-wandering mode is responsible for our moments of greatest creativity and insight, when we're able to solve problems that previously seemed unsolvable by making connections among things that we didn't previously see as connected. Vinod Menon and I showed that the switch is controlled in a part of the brain called the insula, an important structure about an inch or so beneath the top of your head. If the relationship between the central executive system and the mind-wandering system is like a see-saw, then the insula—the attentional switch—is like an adult holding one side down so that the other stays up in the air.

Neurons are living cells with a metabolism; they need oxygen and glucose to survive and when they've been working hard, we experience fatigue. Asking the brain to shift attention from one activity to another causes the brain to burn up oxygenated glucose, the same fuel needed to stay on task. And the kind of rapid, continual shifting we do with multitasking causes the brain to burn through fuel so quickly that we feel exhausted and disoriented after even a short time. We've literally depleted the nutrients in our brain.

Every status update you read on Facebook, every tweet or text message you get from a friend, is competing for resources in your brain with important things like whether to put your savings in stocks or bonds, where you left your passport, or how best to reconcile with a close friend you just had an argument with. If you want to be more productive and creative, and to have more energy, the science dictates that your social networking should be done during a special designated time, not as constant interruptions to your day. Keeping your email program active throughout the workday is also distracting, and email should be best done at designated times (an unread email in your inbox can lower your effective IQ by 10 points). And what about increasing creativity? This will happen naturally as we tame the multi-tasking and immerse ourselves in a single task for sustained periods, say

30 – 50 minutes. And as a boost to creativity, several studies have shown that a walk in nature, exercise, or listening to music can trigger the mind-wandering mode. This acts as a neural reset button, and provides much needed perspective on what you're doing. To work, perchance, to daydream.

Professor Levitin is author of the book The Organized Mind: Thinking Straight in the Age of Information Overload and is speaking at a public lecture organised by the LSE's Centre for Philosophy of Natural and Social Science (@CPNSS) on Monday 26 January – 6.30 – 8.00pm. Click here for more details on the event.



This blog post was originally published at the LSE's Impact of Social Sciences blog.

Note: This article gives the views of the author, and not the position of USApp– American Politics and Policy, nor of the London School of Economics.

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