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Daydream your way to creativity

Updated 15:37 18 June 2012 by [Richard Fisher](#)
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Concentration is overrated. Psychologists are finding that if you let your mind wander it may well stumble upon better ideas

Editorial: "Small sparks of creativity are worth celebrating too"

BELIEVE me, I will try my hardest, but I cannot stop what is going to happen to you in the next 5 minutes. It might be a memory that takes you away... a place that you knew, or an idea you once had. It could be hunger. It could be sex. It could already be happening now.

As you read these sentences, your mind will almost certainly wander at least once - just as mine is drifting as I decide how best to phrase these words so that they hold your attention. In fact, according to some estimates, we may spend nearly 50 per cent of our lives drifting away from the present moment into the world inside our heads.

Sigmund Freud considered such zoning out "infantile"; others feared it could lead to psychosis. Today, we know it is instead the sign of a healthy mind, allowing us to [plan for the future](#) by imagining different events, for instance. One particular virtue might even transform how we work, teach children, operate business and nurture ideas.

Drifting, it seems, is a sure sign that our creative juices are flowing. When it comes to arriving at brilliant ideas, the ability to concentrate is overrated. If a person's mind is wandering, they outperform their peers in a range of tasks where flashes of insight are important, from imaginative word games to exercises in original thinking and invention.

The psychologists researching the benefits of daydreaming would never claim to have found a formula for all creative achievement. But their results suggest that learning how to tread the line between focusing in and zoning out could help you to arrive at a breakthrough you might otherwise have missed.

One of the first psychologists to turn their attention to mind wandering was [Jonathan Schooler](#) of the University of California in Santa Barbara. One day he was listening to a talk on consciousness when the speaker mentioned *the wandering mind*. Schooler was so intrigued that he found it tricky to focus. "My mind kept wandering about mind wandering," he says. He found it peculiar that we should enter the state so frequently. "It's the mind escaping from the present," he says, "and we're doing it all the time."

His subsequent experiments helped to show just how often our minds stray

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A fertile mind? (Image: Jasper James/Getty)

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How to evolve your own musical melodies



20:01 18 June 2012
Since 2009, a website has let visitors evolve their own preferred music using Darwinian principles –

off-piste. In one study, volunteers had to read extracts of Leo Tolstoy's *War and Peace* in his lab. Besides asking them to report whenever they noticed themselves drifting, he would also ask them what they were thinking about at random intervals, and at the end, he tested their comprehension of the text. These measures revealed that people's minds wandered from the words for more than 20 per cent of the time, often without them realising. When faced with other tasks, our capacity for distraction seems even greater; a recent study asking people to report their state of mind at random intervals during the day - via a smartphone app - showed that their attention was wandering from the task at hand a whopping [47 per cent](#) of the time (*Science*, vol 330, p 932).

Flashes of inspiration

For a long time, this kind of mind wandering would have been considered a serious failing. Instead, the ability to filter out distractions and focus on a task - dubbed executive control - was considered to lie behind smart thinking. Since keeping your train of thought on track is necessary to remember information from moment to moment, short-term "working-memory" capacity is often used to gauge executive control. By this measure, a host of studies have shown that people who can focus well tend to ace analytical problems: they are whizzes at arithmetic and verbal reasoning tasks, and often have a higher IQ. If you wanted to be clever, it seemed that you would need to learn how to concentrate.

Yet there were hints that concentration wasn't all it was cracked up to be. While people with a high level of working memory are good at analytical problems, they tend to struggle on tasks that require flashes of inspiration. "Often the best way to solve a problem is to not focus," says [Jennifer Wiley](#) at the University of Illinois in Chicago, who recently reviewed the research (*Psychology of Learning and Motivation*, vol 56, p 185).

Consider the following brain-teaser, which represents one of the types of puzzle used in these studies. What single word can be added to "High, book and sour" to make another word or phrase? To solve it, you can't simply apply an analytical approach since that would involve crunching through every word in your vocabulary, says Wiley. Instead, the answer often comes out of the blue. Various studies show that people with high working-memory capacity, and therefore good executive control, can find it more difficult to solve these problems than people who are more easily distracted. (The answer, by the way, is "note".)

The same goes for other established measures of flexible thinking in the lab ([try some of these puzzles for yourself](#)). In one test, known as the unusual uses task, people are asked to spend a couple of minutes coming up with a range of creative uses for an object, such as a brick, and afterwards they are marked on the quantity and originality of their answers. One study by [Holly White](#), then at the University of Memphis, Tennessee, showed that people with attention-deficit hyperactivity disorder - who have lower working-memory capacity and are prone to zoning out - did better at this test than those without ADHD (*Personality and Individual Differences*, vol 40, p 1121).

([Answers to the puzzles can be found here](#)).

All in all, the findings hinted at one answer to the question of [why we zone out](#): it might lead us to think creatively, beyond the rigid limits imposed by our executive control. It would certainly make sense for moments of insight to come from daydreaming. After all, one important skill for creativity is the ability to link disparate concepts, which you might come across while wandering inside your head. What was missing, however, was a direct test to show that the insights really do come from a daydream, so a team in Schooler's lab, led by Benjamin Baird, set about gathering this crucial evidence.

The experiment took place in three stages. First, the volunteers spent 2 minutes dreaming up unusual uses for a brick. Next, some were given a mindless task to complete, such as watching for letters on a screen. Others were given a much trickier test that required their full attention. As you might expect, subsequent questionnaires revealed that people drifted off significantly more in the mindless task. Finally, unexpectedly, all participants were asked to take another crack at the unusual uses task. This time, those whose minds had been wandering came up with, on average, 40 per cent more answers than on their first go. Those who'd had to concentrate on their task barely improved at all. The results will soon be published in the journal *Psychological Science*.

Crucially, when questioned, the mind wanderers did not report that they had been thinking explicitly about the brick during their mindless task. "It seems to

listen to the results

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have allowed some sort of unconscious process," Schooler says. The message is that as you drift off into memories, thoughts of food or plans for your holiday, your brain is busily mulling over potential solutions for whatever problem you are trying to solve.

Hiding in plain sight

The findings tie neatly with brain scans of the non-focused mind. [Malia Mason](#) of Columbia University, New York, for instance, has used functional MRI to show that periods of mind wandering correlate with activity in a constellation of neural regions across the brain, known collectively as the default network ([Science, vol 315, p 393](#)). This brain network has only recently been discovered - but was hiding in plain sight. For years, researchers had been placing people in brain scanners and failing to note a surge in activity during the supposed resting moments between experimental tasks.

One of the default network's jobs could be to sort through our memories in order to preserve them. It is tempting to speculate that the pathways involved in these searching and sorting duties may also be involved in creativity, by helping us to assess and link those disparate concepts present in our minds.

Surprisingly, a subsequent study by Schooler in 2009 found that in addition to these regions, the drifting mind also activated some parts of the brain that tend to be associated with the executive functions, such as the dorsolateral prefrontal cortex, which lies behind the forehead ([Proceedings of the National Academy of Sciences, vol 106, p 8719](#)).

This is curious, given that mind wandering seems to be the antithesis of the tight focus associated with executive control. But Schooler believes that the activity they observed would not represent concentration, as such - instead, these regions might be recruited to keep track of the important ideas in the fire hose of thoughts released during wandering. Since these regions are thought to be involved in self-awareness, he also wonders if the executive regions are recruited when we suddenly become aware we are daydreaming - which may be important if we are to keep a grasp on the task at hand.

It's worth noting that experiments like dreaming up uses for a brick might not match many people's ideas of creativity. Certainly, this kind of work could not explain the great works of Picasso or the insight of Einstein. It explores one aspect of the creative process - the moment of insight and inspiration when you hit upon a novel thought or solution to a problem. You would need to combine those flashes with great intelligence, hard graft and perhaps some intangible quality, to arrive at anything approaching genius. "The moment you study creativity in the laboratory you dilute it," says [Joydeep Bhattacharya](#) at Goldsmiths University London. "Have we seen hard evidence that daydreaming leads to creativity? Not yet."

Still, there are hints from outside the lab that a wandering mind can bring success in the real world - albeit from a small study. In 2003, [Shelley Carson](#) at Harvard University and colleagues studied people who had written a published novel, patented an invention or had art shown at a gallery. In computer tests that required participants to screen out irrelevant information - latent inhibition tests - she found these high-achievers were less likely to disregard inconsequential details and focus on the task, compared with an average person. In other words, their minds more frequently wandered from the task at hand, a tendency that may have left them open to novel or left-field ideas ([Journal of Personality and Social Psychology, vol 85, p 49](#)).

Even if the work won't help you to win a Pulitzer, it can nevertheless shed light on many of the familiar frustrations we face as we tackle more humdrum creative problems - be it writing a work report or designing a website. After all, we perform little acts of creative thinking just to get us through every day. Only the very biggest ideas come to be recognised by many others and by society - but these are the exception not the rule.

The limitations of a focused mind might explain why good ideas always seem to linger outside our reach when we feel under pressure. Numerous studies have shown that anxiety leads to the exact opposite of the freewheeling mindset you need to create something original. "An anxious mood comes with a high degree of focus," says Mark Jung-Beeman of Northwestern University in Evanston, Illinois, who has investigated the connection between mood and creativity with Karuna Subramaniam.

Mental spotlight

Instead of forcing yourself to concentrate, the best approach when a deadline

looms may be to loosen your grip and take a quick break. By monitoring "alpha" brain waves associated with a chilled mindset, Bhattacharya found that people in a relaxed mood were more likely to find creative solutions to word puzzles (*PLoS ONE*, vol 3, p 1459). "If you consider attention as a spotlight," he says, "it becomes diffuse and splayed out."

Even listening to jokes helps. Subramaniam and colleagues found that watching a Robin Williams stand-up routine helped people subsequently solve mental puzzles. By contrast, those who had just watched a horror movie clip struggled. In another experiment, simply lying down led some participants to feel more relaxed, and [therefore solve more anagrams](#) 📖 - another type of insight problem.

Since we find it difficult to concentrate when we are tired, you might want to flex your creativity when you feel most groggy. Early birds, for instance, find more original solutions late at night, while night owls do better early in the morning (*Thinking and Reasoning*, vol 17, p 387).

If all else fails, a stiff drink can lubricate the mind's cogs. We all know that alcohol can lead even the most focused minds astray, but just to make sure, Schooler and other psychologists decided to get some students drunk before tasting their concentration (*Psychological Science*, vol 20, p 747). Sure enough, the tipsy students found themselves drifting more often than sober participants. That may explain why students stoked up on a vodka-cranberry mix were better able to solve a series of tricky word puzzles that require creative, rather than analytical, solutions. They solved them faster, and in greater number, than those on soft drinks (*Consciousness and Cognition*, vol 21, p 487). By the same token, you should avoid coffee - since caffeine focuses your concentration, it's likely to keep a lid on your creative thinking.

Perhaps you are already in the blissful state of a daydream, though hopefully I managed to hold your attention for most of this article. Still, were you paying attention to the three typos in the previous paragraph? Well done if so. If your mind was somewhere else at that moment, however, I shall take heart in the fact that you were in a creative place.

Richard Fisher is a features editor at *New Scientist*



From issue [2869](#) of *New Scientist* magazine, page 34-37.

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Intuition

Mon Jun 18 20:53:21 BST 2012 by **Dirk Pons**

I'm glad to hear that the sciences are catching up! Many other professions, including my own of engineering design, have been using lateral thinking for years, and are fully aware that creativity involves letting the subconscious cognition suggest alternative trains of thought and parallel associations. The subconscious cognition is a massively

parallel processor, and an effortless one too, compared to the powerful but sequential and effortful conscious cognition. The former is the basis for intuition, and having a mechanism to access it gives designers confidence that the resulting creativity is probably better than spurious. You might be surprised how many of your favourite products are designed with these mechanisms!

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Intuition

Mon Jun 18 23:53:44 BST 2012 by **Gerry Nolan**
http://philosophy-of-pattern.com/gerry-o-nolan/public_html/front-matter/gerryn.html

For further, very informative and entertaining, reading on this subject, read Arthur Koestler's, "The Act of Creation", PAN, 1964, 1969.

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Intuition

Tue Jun 19 01:41:01 BST 2012 by **Michael Burrows**
<http://newsscientist.com>

"Every now and then go away, have a little relaxation, for when you come back to your work your judgment will be surer. Go some distance away because then the work appears smaller and more of it can be taken in at a glance and a lack of harmony and proportion is more readily seen." Da Vinci, Leonardo

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