

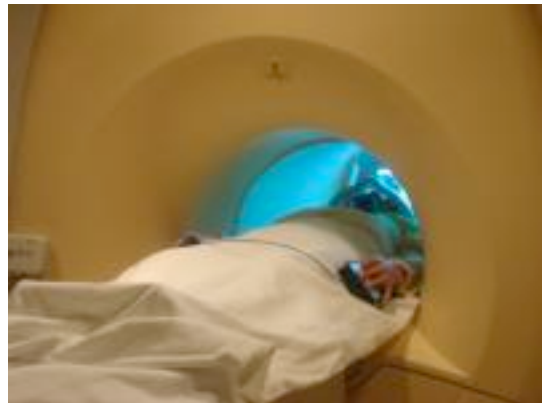
Study links daydreaming to problem-solving

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Courtesy University of British Columbia and [World Science](#) staff

Our brains are much more active when we daydream than previously thought, a study has found.

The research, published in the journal *Proceedings of the National Academy of Sciences*, found that activity in many brain regions increases when our minds wander. It also finds that brain areas associated with complex problem-solving – previously thought to go dormant when we daydream – instead buzz with activity.



“Mind wandering is typically associated with negative things like laziness or inattentiveness,” said University of British Columbia psychologist Kalina Christoff, lead author of the research. But in reality it appears “our brains are very active when we daydream – much more active than when we focus on routine tasks.”

Study participants were placed in a brain scanner, where they performed the simple routine task of pushing a button when numbers appear on a screen. The researchers tracked subjects’ attentiveness moment-to-moment through brain scans, subjective reports from subjects and by tracking their performance on the task.

The findings suggest that daydreaming – which can occupy as much as one third of our waking lives – is an important cognitive state where we unconsciously turn our attention from immediate tasks to sort through important problems in our lives, Christoff said.

Until now, the brain’s “default network” – which is linked to easy, routine mental activity and includes zones known as the medial prefrontal cortex, the posterior cingulate cortex and the temporoparietal junction – was the only part of the brain thought to be active when our minds wander, Christoff explained.

But the study found that an “executive network” – tied to high-level, complex problem-solving – also becomes activated when we daydream. These areas include regions known as the lateral prefrontal cortex and the dorsal anterior cingulate cortex. The study utilized the brain scanning technique functional Magnetic Resonance Imaging, which tracks blood flow in the brain.

“This is a surprising finding, that these two brain networks are activated in parallel,” said Christoff. “Until now, scientists have thought they operated on an either-or basis – when one was activated, the other was thought to be dormant.” The less subjects were aware that their mind was wandering, the more both networks were activated.

The quantity and quality of brain activity suggests that people struggling to solve complicated problems might be better off switching to a simpler task and letting their mind wander, Christoff said.

“When you daydream, you may not be achieving your immediate goal – say reading a book or paying attention in class – but your mind may be taking that time to address more important questions in your life, such as advancing your career or personal relationships,” said Christoff.

Image: A subject performs a routine task in an MRI brain scanner. (Image courtesy of Prof. Kalina Christoff)