

Too much focus can impair certain types of learning, researchers find

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Alexandra Decker was breezing through her multiple-choice driving exam when she realized the correct answer was always the longest and most detailed—an insight she may have overlooked if her attention had

been trained on the questions themselves.

"If I had been focused on just the lesson material and choosing the right answer," she says, "I might not have picked up on that pattern."

Decker is a post-doctoral researcher at the Massachusetts Institute of Technology's McGovern Institute for Brain Research and a former graduate student in the labs of Amy Finn and Katherine Duncan—both associate professors in the University of Toronto's department of psychology in the Faculty of Arts & Science.

What Decker experienced was our ability to learn secondary or non-targeted information when our attention on the primary or targeted information lapses—the subject of a paper that she and fellow co-lead authors Finn, Duncan, and Michael Dubois published recently in the journal *Psychonomic Bulletin & Review*.

"We experience attentional lapses all the time, and generally, they're considered a bad thing," says Decker, who worked on the study before joining MIT. "But we wanted to know whether being too focused on a learning goal might not be a good thing and whether attentional lapses can broaden our attention and enable us to take in more information from our environment."

What the researchers found was that study participants demonstrated heightened learning of non-targeted information when their attention to targeted information lapsed. They also showed that participants who spent more time in a poor attentional state displayed the greatest learning about peripheral information.

"Our conclusion is that these attentional lapses can be helpful for learning because when we're too focused or too fixated, we miss information in our environment that might be useful," says Decker.

'An attention lapse is not necessarily a bad thing'

Dubois says the finding runs counter to conventional thinking.

"A lot of work has been done to try and improve attention and stay focused longer," says Dubois. "But our thinking is that we should reconceptualize lapses in attention as opportunities to learn something else. In other words, an attention lapse is not necessarily a bad thing."

The result provides insight into a long-standing debate about two contrasting theories of attention lapses.

First is the overload or depletion theory, which suggests we have a finite amount of attention to give and when we use it up, we learn neither goal-relevant nor goal-irrelevant information.

But the study seems to support underload theories that say attentional lapses promote learning of goal-irrelevant content because lapses in attention are not due to the depletion of an attention resource. Rather, they posit that attention is diverted away from the main task when it becomes too monotonous.

The authors conducted their research by enlisting 53 U of T undergraduate students. The students were instructed to observe a series of slides, each displaying a letter or number in the center, flanked by two non-alphanumeric symbols—for example, #, * and @.

The students' targeted task—which became monotonous because it was so simple—was to concentrate on the central symbol and press the "f" key if it was a letter, or a "j" key if it was number. They were told to ignore the flanking symbols and were not told there was a pattern—that one symbol was more likely to appear beside letters and another symbol beside numbers.

Despite these instructions and despite not knowing that different symbols were associated with numbers and letters, students did indeed notice the pattern.

The study may explain how people with reduced attentional control, including aging adults, children and young adults with high impulsivity, demonstrate better learning of goal-irrelevant information.

The researchers also speculate that we have attention lapses because it's helpful in learning things you don't necessarily think are relevant in the moment—not just because it's hard to maintain attention for a long time.

"Our ability to [focus](#) and learn may come at the cost of learning about a lot of other information that we don't think is relevant at the moment," says Finn. "Because there's a lot of information to be learned from our environment that isn't obvious. Our study shows that perhaps we need to acknowledge that there's more than one way of [learning](#)."

More information: Alexandra Decker et al, Pay attention and you might miss it: Greater learning during attentional lapses, *Psychonomic Bulletin & Review* (2022). [DOI: 10.3758/s13423-022-02226-6](https://doi.org/10.3758/s13423-022-02226-6)

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