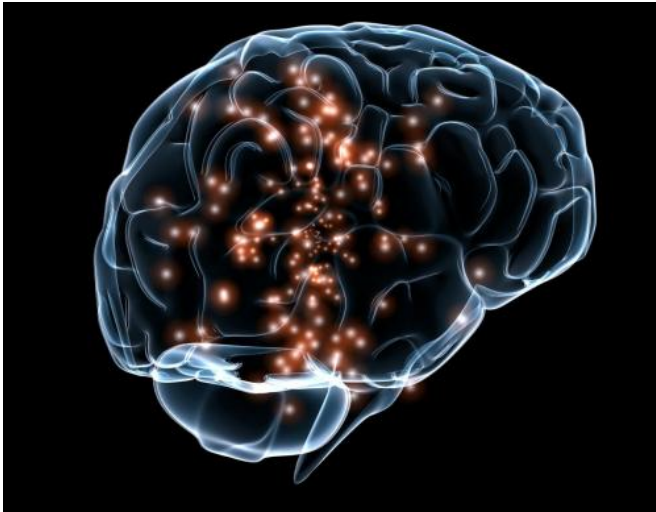


# In people who intentionally let their minds wander, two main brain cell networks broadly overlap

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Credit: Wikimedia Commons

Our thoughts are not always tethered to events in the moment. Although mind wandering is often considered a lapse in attention, scientists at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig and the University of York in England have shown that when we engage internal thoughts in a deliberate manner, this is reflected by more effective processing in brain systems involved in cognitive control. This could explain why some people benefit from letting their thoughts run free and other do not.

Since people start to make mistakes as soon as they lose concentration on their surroundings, [mind wandering](#) has long been interpreted as a failure in control. Now we know that this phenomenon is more complex: Besides the unintentional, spontaneous wandering of our thoughts, [mind wandering](#) can serve as a kind of deliberate mental rehearsal that allows us to consider future events

and solve problems.

Scientists at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig and the University of York in England have shown that involuntary and intentional mind wandering can be dissociated based on [brain structure](#) and function, building on prior studies that demonstrate behavioral and psychological differences. "We found that in people who often purposefully allow their minds to go off on a tangent the cortex is thicker in some prefrontal regions", says Johannes Golchert, PhD student at the Max Planck Institute in Leipzig and first author of the study. "Furthermore, we found that in people who intentionally mind wander, two main brain networks broadly overlap each other: the default-mode network, which is active when focusing on information from memory, and the fronto-parietal network, which stabilizes our focus and inhibits irrelevant stimuli as part of our [cognitive control](#) system."

While both networks are strongly connected to each other, the control network can influence our thoughts, helping us focus on goals in a more stable manner. This can be seen as evidence that our mental control is not impaired when we deliberately allow our mind to wander. "In this case, our brain barely distinguishes between focusing outwards on our environment or inwards on our thoughts. In both situations the control network is involved", Golchert explains. "Mind wandering should not just be considered as something disturbing. If you're able to control it to some extent, that is to say, suppress it when necessary and to let it run free when possible, then you can make the most of it."

The neuroscientists investigated these relationships using psychological questionnaires and [magnetic resonance imaging](#) (MRI). Participants were asked

to respond to statements such as: "I allow my thoughts to wander on purpose," or "I find my thoughts wandering spontaneously", and then underwent MRI scanning for measures of brain structure and connectivity. The differences in types of mind wandering across participants were then related to differences in brain organization.

**More information:** Johannes Golchert et al. Individual variation in intentionality in the mind-wandering state is reflected in the integration of the default-mode, fronto-parietal, and limbic networks, *NeuroImage* (2017). DOI: [10.1016/j.neuroimage.2016.11.025](https://doi.org/10.1016/j.neuroimage.2016.11.025)

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