

Activity in brain networks related to features of depression

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Depressed individuals with a tendency to ruminate on negative thoughts, i.e. to repeatedly think about particular negative thoughts or memories, show different patterns of brain network activation compared to healthy individuals, report scientists of a new study in *Biological Psychiatry*.

The risk for depression is increased in individuals with a tendency towards negative ruminations, but patterns of autobiographic memory also may be predictive of depression.

When asked to recall specific events, some individuals have a tendency to recall broader categories of events instead of specific events. This is termed overgeneral memory and, like those who tend to ruminate, these individuals also have a higher risk of developing depression.

These self-referential activities engage a network of brain regions called the default mode network, or DMN. Prior studies using imaging techniques have already shown that the DMN activates abnormally in individuals with depression, but the relationship between DMN activity and depressive ruminations was not clear.

In this new report, Dr. Shuqiao Yao of Central South University in Hunan, China and colleagues evaluated DMN functional connectivity in untreated young adults experiencing their first episode of [major depression](#) and healthy volunteers. Each participant underwent a brain scan and completed tests to measure their levels of rumination and overgeneral memory.

As expected, the [depressed patients](#) exhibited higher levels of rumination and overgeneral memory than did the control subjects. They also observed increased functional connectivity in the anterior medial cortex regions and decreased [functional connectivity](#) in the posterior medial cortex regions in depressed patients compared with control subjects.

Among the depressed subjects, an interesting pattern of dissociation emerged. The increased connectivity in anterior regions was positively associated with rumination, while the decreased connectivity in posterior regions was negatively associated with overgeneral memory.

Dr. Yao commented on the importance of these findings: "In the future, resting-state network activity in the brain will provide useful models for investigating network features of cognitive dysfunction in psychopathology."

"As we dig deeper in brain imaging studies, we are becoming increasingly interested in the activity of brain circuits rather than single [brain regions](#)," said Dr. John Krystal, Editor of [Biological Psychiatry](#). "Although it is a more complicated process, studying brain circuits may provide greater insight into symptoms, such as depressive ruminations. The current study nicely illustrates how altered activity at different sites within a brain network may be related to different features of depression."

More information: The article is "Evidence of a Dissociation Pattern in Resting-State Default Mode Network Connectivity in First-Episode, Treatment-Naive Major Depression Patients" by Xueling Zhu, Xiang Wang, Jin Xiao, Jian Liao, Mingtian Zhong, Wei Wang, and Shuqiao Yao ([doi:10.1016/j.biopsych.2011.10.035](https://doi.org/10.1016/j.biopsych.2011.10.035)). The article appears in *Biological Psychiatry*, Volume 71, Issue 7 (April 1, 2012).

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