

TOOLBOX

Magnet reveals differences in Asperger syndrome brains

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A powerful magnet that alters brain activity has shown that a brain region responsible for language may function differently in adults with Asperger syndrome than in controls, according to a study published in the July issue of the *European Journal of Neuroscience*¹.

The technique, called transcranial magnetic stimulation, or TMS, reversibly alters brain function in response to a magnet placed outside the brain. It allows researchers to inactivate regions responsible for certain functions, such as language, while an individual is awake and speaking.

Low-frequency repetitive TMS is generally believed to inactivate targeted brain regions by disrupting electromagnetic signals. However, critics maintain that it is impossible to know what TMS does to the brain and whether it directly affects the targeted regions.

In the new study, researchers used TMS to affect Broca's area — a brain region responsible for language — in 10 individuals with Asperger syndrome and 10 age- and gender-matched controls. A study published last year found that this region shows **more curvature** in individuals with Asperger syndrome than in those with autism. The region also **does not form typical connections** with other language areas when individuals with autism listen to speech.

Participants in the new study took a test that measures how quickly they can name images of various objects, such as a protractor or a harp, after they had 30 minutes of TMS or sham TMS to four different regions within Broca's area: the left and right pars opercularis and the left and right pars triangularis. Neither the participants nor the researchers knew whether the TMS was sham or real, nor which region had been targeted for which test.

Before TMS, the two groups performed equally in the naming test, taking approximately 450 milliseconds to correctly name the object. However, after TMS of the left pars triangularis, individuals with Asperger syndrome named objects in 300 milliseconds on average. TMS of the left

opercularis, an adjacent region, lengthened their naming response to 600 milliseconds. The response times of control individuals did not vary between the sham and real TMS treatments.

The results suggest that individuals with Asperger syndrome may use atypical patterns of brain activity when naming objects, perhaps as a compensatory mechanism, the researchers say.

References:

1.

Fecteau S. *et al. Eur. J. Neurosci.* **34**, 158-164 (2011) [PubMed](#)