

Impulsive versus controlled men: Disinhibited brains and disinhibited behavior

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Impulsive individuals tend to display aggressive behavior and have challenges ranging from drug and alcohol abuse, to problem gambling and difficult relationships. They are less able to adapt to different social situations. Impulsivity is also a common feature of psychiatric disorders. New research in *Biological Psychiatry* shows that people may react this way, in part, because they have lower levels of GABA (gamma-aminobutyric acid), the most important inhibitory neurotransmitter, in a specific part of their brain involved in regulating self-control.

"Advances in brain imaging techniques mean we are able to investigate different and specific areas of the human brain and see how they regulate people's behavior," explained Dr. Frederic Boy, who led the research. "What is clear is that the way people behave results from a complex interaction between a number of genetic, social and environmental factors."

The scientists studied males with no history of [psychiatric disorders](#) or [substance dependence](#), who completed a questionnaire which helped assess different aspects of impulsivity, an important component of self-control. They underwent a specialized [magnetic resonance spectroscopy](#) brain scan, an imaging technique that allows measurement of the amount of GABA in small regions of the brain.

The team found that men with more GABA in their [dorsolateral prefrontal cortex](#) had lower scores in one aspect of impulsivity called the "feeling of urgency", the tendency to act rashly in response to distress or

other strong emotions and urges. Inversely, men with lower GABA tended to have higher urgency ratings. These findings add to evidence that "low GABA may be a risk factor for cortical dysfunction across a number of disorders, as depression and panic disorder are associated with low cortical GABA," commented Dr. John Krystal, Editor of [Biological Psychiatry](#), which published the research. These findings may also hold true in women, but women were not included in this study due to the possible effect of natural hormonal fluctuations.

The authors note that the next stages of research need to focus on further disentangling this relationship between GABA and the dorsolateral prefrontal cortex. "After that we can start evaluating whether there's any way in which we could treat a GABA deficit in this area. I suspect this could be difficult, as GABA is present throughout the brain, and raising the level indiscriminately may have all sorts of unforeseen consequences," said Dr. Boy. "The other area which needs further research is whether GABA levels in the dorsolateral prefrontal cortex fluctuate over time, as this study is simply a snapshot of levels on one given day." This future research will be important to help further uncover the links between behavior and possible cortical dysfunction.

More information: The article is "Dorsolateral Prefrontal γ -Aminobutyric Acid in Men Predicts Individual Differences in Rash Impulsivity" by Frederic Boy, C. John Evans, Richard A.E. Edden, Andrew D. Lawrence, Krish D. Singh, Masud Husain, and Petroc Sumner. Boy, Evans, Lawrence, Singh, and Sumner are affiliated with Cardiff University, Cardiff, United Kingdom. Husain is affiliated with University College London, London, United Kingdom. Edden is affiliated with The Johns Hopkins University and Kennedy Krieger Institute, both in Baltimore, Maryland. The article appears in *Biological Psychiatry*, Volume 70, Number 9 (November 1, 2011)

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