

# People who experience rage attacks have smaller "emotional brains"

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Neuroimaging studies suggest that frontolimbic regions of the brain, structures that regulate emotions, play an important role in the biology of aggressive behavior.

A new article published in the inaugural issue of the journal *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* reports that individuals with intermittent explosive disorder (IED) have significantly lower gray matter volume in these frontolimbic brain structures. In other words, these people have smaller "emotional brains."

"Intermittent explosive disorder is defined in DSM-5 as recurrent, problematic, impulsive aggression," explained Dr. Emil Coccaro, the article's lead author. "While more common than bipolar disorder and schizophrenia combined, many in the scientific and lay communities believe that [impulsive aggression](#) is simply 'bad behavior' that requires an 'attitude adjustment.' However, our data confirm that IED, as defined by DSM-5, is a brain disorder and not simply a disorder of 'personality.'" Dr. Coccaro is the E.C. Manning Professor and Chair of Psychiatry and Behavioral Neuroscience at the University of Chicago.

Dr. Coccaro and his colleagues also report a significant inverse correlation between measures of aggression and frontolimbic gray matter volume.

The investigators collected high-resolution magnetic resonance imaging (MRI) scans in 168 subjects, including 57 subjects with IED, 53 healthy control subjects, and 58 psychiatric control subjects. The team found a direct correlation between history of actual [aggressive behavior](#) and the magnitude of reduction in [gray matter](#) volume, linking both in a dimensional relationship.

"Across all subjects, reduced volume in frontolimbic brain structures was associated with increased aggressiveness," commented Dr.

Cameron Carter, Professor of Psychiatry and Behavioral Sciences at University of California, Davis and Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. "These important findings suggest that disrupted development of the brain's emotion-regulating circuitry may underlie an individual's propensity for rage and aggression."

**More information:** Emil F. Coccaro et al. Frontolimbic Morphometric Abnormalities in Intermittent Explosive Disorder and Aggression, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2016). DOI: [10.1016/j.bpsc.2015.09.006](https://doi.org/10.1016/j.bpsc.2015.09.006)

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