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Contact: Rhiannon Bugno, Editorial Office
+214 648 0880
BPCNNI@utsouthwestern.edu

People Who Experience Rage Attacks Have Smaller "Emotional Brains"

Reports new study in Biological Psychiatry: Cognitive Neuroscience and Neuroimaging

Philadelphia, PA, January 12, 2016 – 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."

The article is "Frontolimbic Morphometric Abnormalities in Intermittent Explosive Disorder and Aggression" by Emil F. Coccaro, Daniel A. Fitzgerald, Royce Lee, Michael McCloskey, and K. Luan Phan (doi: 10.1016/j.bpsc.2015.09.006). The article appears in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, Volume 1, Issue 1 (January 2016), published by Elsevier.

Notes for editors

Full text of the article is available to credentialed journalists upon request; contact Rhiannon Bugno at +1 214 648 0880 or BPCNNI@utsouthwestern.edu. Journalists wishing to interview the authors may contact Emil Coccaro at ecoccaro@bsd.uchicago.edu.

The authors' affiliations, and disclosures of financial and conflicts of interests are available in the article.

Cameron S. Carter, M.D., is Professor of Psychiatry and Psychology and Director of the Center for Neuroscience at the University of California, Davis. His disclosures of financial and conflicts of interests are available [here](#).

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Biological Psychiatry: Cognitive Neuroscience and Neuroimaging is an official journal of the [Society of Biological Psychiatry](#), whose purpose is to promote excellence in scientific research and education in fields that investigate the nature, causes, mechanisms and treatments of disorders of thought, emotion, or behavior. In accord with this mission, this peer-reviewed, rapid-publication, international journal focuses on studies using the tools and constructs of cognitive neuroscience, including the full range of non-invasive neuroimaging and human extra- and intracranial physiological recording methodologies. It publishes both basic and clinical studies, including those that incorporate genetic data, pharmacological challenges, and computational modeling approaches.

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Media contact

Rhiannon Bugno

Editorial Office

+1 214 648 0880

BPCNNI@utsouthwestern.edu