

# Brain scans appear to show changes associated with violent behavior

June 6 2011

---

A brain imaging study suggests that men with a history of violent behavior may have greater gray matter volume in certain brain areas, whereas men with a history of substance use disorders may have reduced gray matter volume in other brain areas, according to a report published online today by the *Archives of General Psychiatry*.

According to background information in the article, research suggests that violent behavior may stem from a complicated mix of biological, psychological, and [social factors](#). Studies of the brains of violent individuals have yielded preliminary information, yet scientists still have much to learn. "The interpretation of studies of the brain morphology of violent offenders is further limited by the fact that most of these men present with a substance use disorder (SUD)," write the authors. "Thus, teasing apart alterations in [brain structure](#) associated with persistent [violent behavior](#) and those associated with SUDs presents an ongoing challenge."

Boris Schiffer, Ph.D., from the University of Duisburg-Essen in Germany, and colleagues compared violent offenders, both with (12) and without SUDs (12), with nonviolent men, both with (13) and without SUDs (14). The first group was recruited from penitentiaries and forensic hospitals, and the second group was recruited from psychiatric outpatient programs and by advertisements and employment agencies. Experienced psychiatrists assessed the participants—all men between 23 and 54 years—for mental disorders, psychopathy, aggressive behavior, and impulsivity. All study participants underwent structural magnetic

resonance imaging at a university hospital.

The researchers identified differences in the brains of men in the various categories. Participants with a history of violence and had a greater volume of [gray matter](#) in certain [brain areas](#) than nonviolent participants, regardless of a history of SUDs. The increases in gray matter volume among violent offenders appeared in the mesolimbic areas of the brain, which previous research suggests are linked to feelings of desire and reward as well as antisocial behavior and psychopathology. Further, gray matter decreases in other areas of the brain characterized men with SUDs regardless of a history of violence.

The larger gray matter volumes in participants with violent tendencies were associated with higher scores for psychopathy and lifelong aggressiveness, whereas the smaller volumes of gray matter in those with SUDs appeared to be related to response inhibition. Among men with SUDs, the study found smaller gray matter volume in areas of the brain that play a part in social behavior as well inhibition. The authors call for more research "to link the observed structural abnormalities to specific deficits in functioning assessed by both neuropsychological tests and behavior in the real world and to the interactions of genes and environmental factors."

**More information:** Arch Gen Psych. 2011;  
[doi:10.1001/archgenpsychiatry.2011.61](https://doi.org/10.1001/archgenpsychiatry.2011.61)

Provided by JAMA and Archives Journals

Citation: Brain scans appear to show changes associated with violent behavior (2011, June 6)  
retrieved 27 April 2024 from  
<https://medicalxpress.com/news/2011-06-brain-scans-violent-behavior.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.