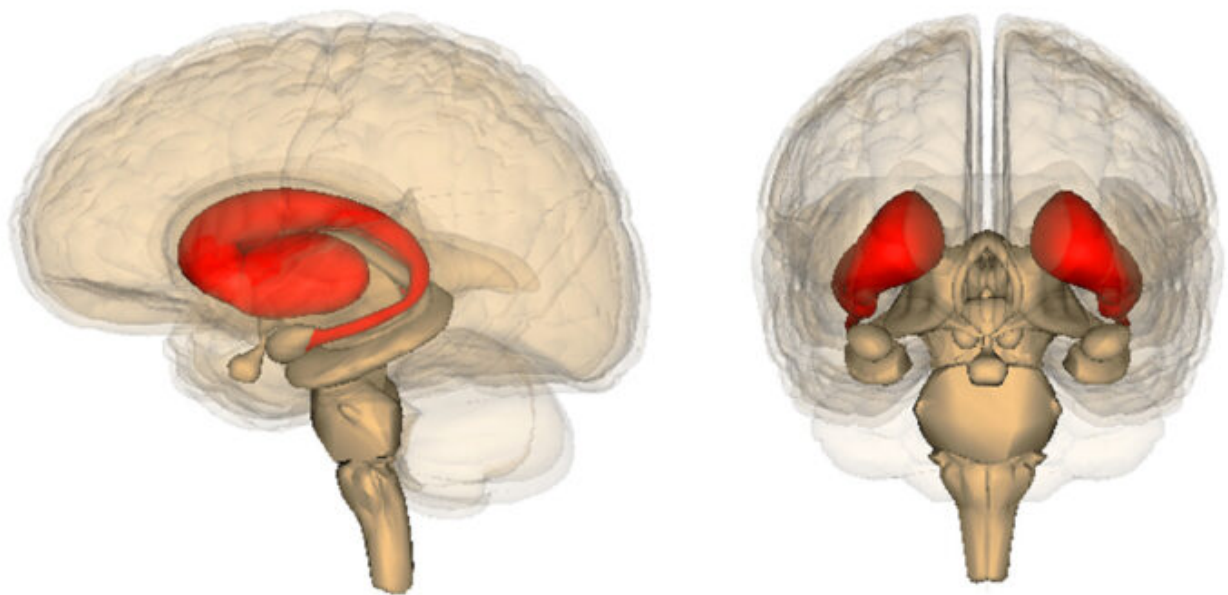


Psychologists observe larger striatal volumes in psychopathic adults

by [Eric W. Dolan](#) June 20, 2022 in [Cognitive Science](#), [Mental Health](#)



The striatum in the brain, highlighted in red. (Photo credit: Anatomography)

[Share on Facebook](#)

[Share on Twitter](#)

A region of the forebrain known as the striatum tends to be larger in psychopathic individuals, according to new neuroimaging findings published in the [Journal of Psychiatric Research](#).

“We were interested in studying the neurobiological underpinnings of psychopathy. Specifically, although many researchers have studied psychopathy, there is little known about the involvement of this brain region, the striatum, in psychopathy,” said study author [Olivia Choy](#), an assistant professor of psychology at Nanyang Technological University in Singapore.

Previous studies examining striatal volume in adults with psychopathy have found mixed results. But the inconsistent findings could be the result of comorbidity between psychopathy and several psychiatric conditions, such as substance dependence and attention deficit hyper-activity disorder (ADHD). Only three previous studies examining the topic controlled for psychiatric comorbidity other than substance use.

For their new study, Choy and her colleagues used magnetic resonance imaging to examine the brain structure of 108 men from the Los Angeles area and interviewed them using the Psychopathy Checklist — Revised, a psychological screening tool to determine the presence of psychopathic traits in individuals.

“The use of the Psychopathy Checklist — Revised in a community sample remains a novel scientific approach: Helping us understand psychopathic traits in individuals who are not in jails and prisons, but rather in those who walk among us each day,” said co-author Robert Schug of California State University in a [news release](#).

The researchers found that psychopathic individuals had a 9.4% larger striatal volume on average compared to matched controls. A supplementary analysis of 12 female participants provided preliminary evidence the findings may extend to women as well.

“Adults with more psychopathic traits have larger volumes of the striatum, a brain area that is involved in processing reward-related information,” Choy told PsyPost. “This suggests that there can be structural brain differences between individuals with psychopathic traits and individuals without. We also find that impulsivity and need for stimulation partly explain why larger striatal volumes are linked to psychopathy.”

The findings held after the researchers controlled for antisocial personality disorder, past or current substance dependence and abuse, ADHD, history of head injury, total brain volume, exposure to childhood family adversity and abuse, and demographic variables such as age.

Choy and her colleagues also found that stimulation-seeking and impulsivity partly mediated the relationship between striatal volume and psychopathy.

“We have always known that psychopaths go to extreme lengths to seek out rewards, including criminal activities that involve property, sex, and drugs. We are now finding out a neurobiological underpinning of this impulsive and stimulating behavior in the form of enlargement to the striatum, a key brain area involved in rewards,” said co-author Adrian Raine of the University of Pennsylvania in a news release.

While the new study provides important clues about the development of psychopathy, the researchers cautioned that the findings cannot determine causality.

“A couple of caveats are that the study was cross-sectional and only the anatomical structure of the brain was assessed, so we cannot make claims about the causal role of the striatum on psychopathy or about brain function,” Choy explained. “Additionally, what causes enlargement of the striatum in adults with psychopathy remains an unresolved issue.”

The study, “[Larger striatal volume is associated with increased adult psychopathy](#)“, was published March 6, 2022.