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Brain Differences in Psychopaths

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Diana Fishbein, Ph.D.



In a recent study led by RTI, researchers found that the impulsiveness, poor judgment, and risk-taking behavior of psychopaths may be attributable in part to differences in brain function.

The study was among the first to examine and compare variations in brain activity between psychopaths and people without the disorder. The findings of this research, led by Diana Fishbein, director of the [Transdisciplinary Behavioral Science Program](#) in Health, Social, and Economics Research (HSER), emerged from a study to better understand brain mechanisms in drug addiction.

Aware that psychopaths display a high incidence of drug and alcohol abuse, Fishbein and her colleagues at RTI reanalyzed their initial data, focusing on this subgroup.

The researchers examined the brains of 13 psychopaths and 15 non-psychopaths using a positron emission tomography (PET) scanner while the participants completed two neurocognitive tasks on a computer. The computerized tasks measured risk-taking tendencies and decision-making ability by presenting participants with two choices: relatively "safe" choices with smaller rewards and penalties, and riskier choices with larger rewards and penalties.

After adjusting for the differences from the effects of drugs on brain function, the researchers found that the psychopath group had a tendency to continue to choose higher-risk options than non-psychopaths, even after learning the consequences. During task performance, psychopaths showed greater activity than non-psychopaths within the parts of the brain that are sensitive to reward and error-monitoring, while the non-psychopaths showed more activity in areas of the brain responsible for impulse control, abstract thinking, goal direction, and social skills than did the non-psychopath group.

These findings suggest that the way the brain functions in psychopaths while engaging in risky decision making may compromise psychopaths' ability to restrain themselves when presented with high-risk options.

"With additional research, we may be able to pinpoint not only the neurological underpinnings of this disorder, but perhaps also its origins," Fishbein said. "If we can better understand why some people are psychopathic, the information may lead to more effective treatments and, possibly, preventive interventions."



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