

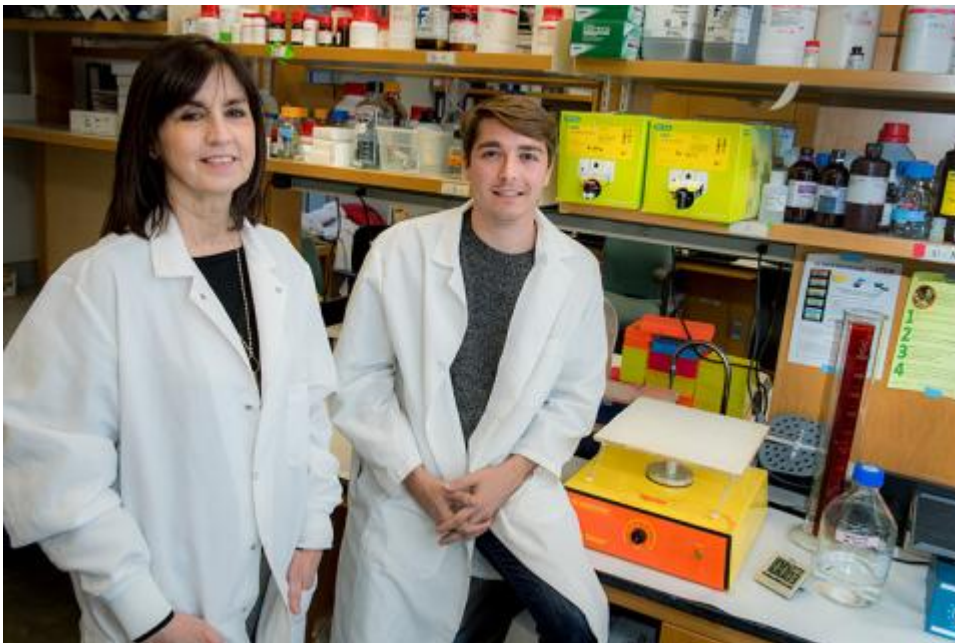
Impulse control subject of Tulane Brain Institute study

December 12th, 2017

|

Barri Bronston bbronst@tulane.edu

[View PDF](#)



Professor Jill Daniel, director of the Tulane Brain Institute, and graduate student Jeffrey Darling are studying impulse control differences in males and females. (Photo by Paula Burch-Celentano)

A Tulane University researcher is studying why males have more impulse-control issues than females, with the ultimate goal of developing more effective preventative and treatment strategies.

Psychology and neuroscience professor [Jill Daniel](#), director of the [Tulane Brain Institute](#), received a two-year, \$414,000 grant from the National Institutes of Health to gain a better understanding of why males are more vulnerable to such disorders

as attention-deficit hyperactivity disorder and addiction.

“The basis for this sex difference is likely complex, but is also likely to include a biological component,” Daniel said. “The long-term goal of the current research is to elucidate brain mechanisms that mediate increased biological vulnerability exhibited by males as compared to females to disorders of impulse control.”

The prefrontal cortex of the brain is thought to influence impulsivity by communicating with the striatum, a brain area that helps control motor output or actions. Two neural pathways of the striatum have opposing effects on behavior. The so-called “go” pathway facilitates motor output whereas the “no-go” pathway inhibits motor output. The prefrontal cortex helps to coordinate the activity of these two pathways in order to provide for release of desired behaviors while inhibiting undesired ones.

Daniel, along with graduate student Jeffrey Darling, is investigating potential sex differences in the prefrontal cortex control over the “go” and “no-go” striatal pathways. They hypothesize that the relative contributions of these pathways for control of behavior differs between the sexes with females, on average, having increased input from the prefrontal cortex to the striatum as compared to males. This increased input to the striatum would provide greater cortical control and activation of the “no-go” pathway over the “go” pathway ultimately resulting in greater inhibitory control over behavior in females than in males.

“The results of this research should provide a foundation to further explore how biological sex interacts with individual risk factors to increase vulnerability to disorders characterized by deficits in impulse control,” Daniel said.