

# Study shows link between teen impatience and neural development in the brain

June 23 2015, by Bob Yirka

---



Credit: Jourden C/public domain

(Medical Xpress)—A team of researchers with members from the U.S.

and Germany has found a connection between neural development in one part of the brain and teen impatience. In their paper published in *Proceedings of the National Academy of Sciences*, the group describes experiments they conducted with volunteers and MRI machines and what they found by doing so.

Most everyone knows that teenagers are more impulsive than other [age groups](#), which most would agree is tied to impatience—and that of course can lead to trouble such as engaging in dangerous behavior. But is the behavior due to the lifestyle young people live, to their lack of [life experience](#) or does it have something to do with their brains? To find out, the researchers enlisted the assistance of 50 pre-adolescent, adolescent and young adult volunteers. Each was asked a series of questions as they underwent MRI [brain](#) scans. The questions were geared towards highlighting impatience—the volunteers were asked which would they take, for example, a small monetary reward now, or a larger one later. Many variations on this theme were presented to allow for fine tuning the responses.

Analysis of the data revealed that the teenaged volunteers tended to go for the more immediate reward, though it depended, of course, on the size of each. But it also showed something else, the team reports—such decisions appeared to be based more on relative future orientation than on sensitivity to immediate rewards.

To find an explanation for the differences between the age groups, the researchers looked at the brain scans and found that as the children aged, impatience increased along with the number of nerve connections in a part of the brain called the dorso-lateral prefrontal cortex—that they say appears to be a likely factor contributing to both impatience and impulsivity. It is only after the brain has had time to get used to the new neural network, along with more life experience, that people become more patient.

The researchers are hoping that research such as theirs might help to better understand other kinds of impatience or impulsivity, such as drug overuse or other risky behavior that continues in later life and then perhaps to find a way to help such people gain more control over their lives.

**More information:** Adolescent impatience decreases with increased frontostriatal connectivity, Wouter van den Bos, [DOI: 10.1073/pnas.1423095112](https://doi.org/10.1073/pnas.1423095112)

### **Abstract**

Adolescence is a developmental period associated with an increase in impulsivity. Impulsivity is a multidimensional construct, and in this study we focus on one of the underlying components: impatience. Impatience can result from (i) disregard of future outcomes and/or (ii) oversensitivity to immediate rewards, but it is not known which of these evaluative processes underlie developmental changes. To distinguish between these two causes, we investigated developmental changes in the structural and functional connectivity of different frontostriatal tracts. We report that adolescents were more impatient on an intertemporal choice task and reported less future orientation, but not more present hedonism, than young adults. Developmental increases in structural connectivity strength in the right dorsolateral prefrontal tract were related to increased negative functional coupling with the striatum and an age-related decrease in discount rates. Our results suggest that mainly increased control, and the integration of future-oriented thought, drives the reduction in impatience across adolescence.

[Press release](#)

© 2015 Medical Xpress

Citation: Study shows link between teen impatience and neural development in the brain (2015, June 23) retrieved 19 November 2023 from <https://medicalxpress.com/news/2015-06-link-teen-impatience-neural-brain.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.