

Researchers able to determine brain maturity through analyzing MRI scans

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Using MRI technology and mathematical analysis, researchers at Oregon Health & Science University and Washington University in St. Louis are now able to accurately predict a young person's age simply by studying their brain scans. The research, which will likely have several clinical applications, including assessment and diagnosis, is published in the current edition of the journal *Science*.

For several years, OHSU researcher Damien Fair, Ph.D., and his colleagues at Washington University, Nico Dosenbach, M.D., Ph.D., and Bradley Schlaggar, M.D., Ph.D., have been studying development of the [brain](#) using a technology called functional MRI. Traditional functional [MRI](#) allows for brain images to be taken while a person is performing an activity. However, in this instance, the scientists use the method to examine the brain is idle or at rest.

Previously, Fair used this information to demonstrate how brains develop throughout life. In short, when we are young, brain activity is more localized in the brain. However, as we develop, these connections in the brain become more complex and distributed — much like the way a city's transportation system becomes bigger and more complex as the city grows.

"By utilizing this approach along with complex [mathematical analysis](#), called machine learning, we found that we could create a form of brain development yardstick, or what Dr. Dosenbach calls a maturation index," said Fair, a postdoctoral research scientist in psychiatry, OHSU School

of Medicine. "Using this yardstick of sorts, we learned that you could effectively determine the subjects level of brain development."

The researchers hope that, upon further development, the technology will assist in comparing brain function across populations to assess childhood development during the aging process. For instance, a percentile scale could be developed to gauge brain development much in the way weight and height percentiles are calculated for growing children. Such a tool could highlight individual needs and lead to specific ways of helping individual children.

In the future, this form of analysis may also play a key role in diagnosing childhood developmental delay, ADHD and autism.

"In many cases it can be vey hard to diagnose and properly characterize these problems, which is why we are so encouraged by these findings," added Fair.

Provided by Oregon Health & Science University

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