



**The READ Study**  
Reading  
Executive function  
Attention  
Dyslexia



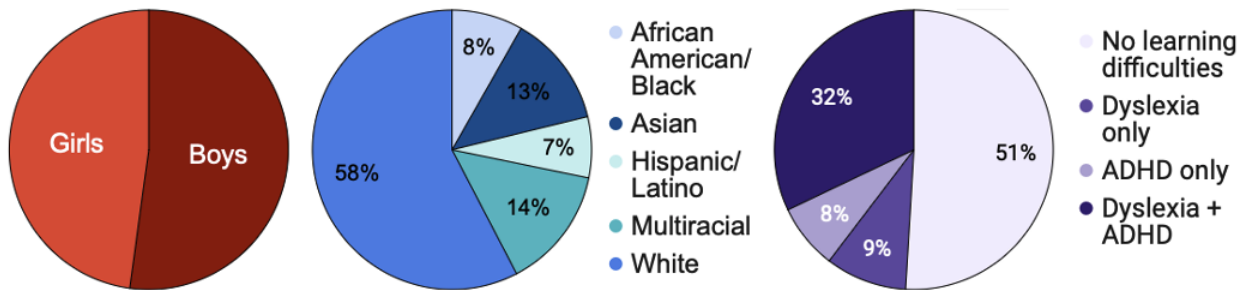
September 5, 2023

Dear Families,

We launched our READ Study in March, 2023. In addition to your child participating, nearly 70 children have also joined our research! This newsletter includes updates about the study and steps to come.

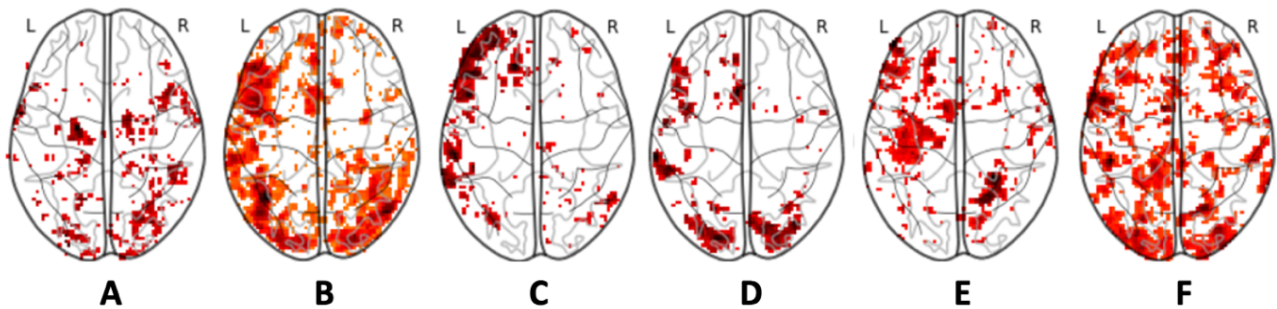
### Who participated?

Here is some information about the young scientists who have contributed to our understanding of reading and the brain so far:



### What does a reading brain look like?

Reading brains are amazingly diverse! Here is the brain activation from 6 different students doing the same reading task while the MRI scanner captured their brain activity. Three of these individuals have dyslexia.\*\* As you can see, **we can't tell by looking at a person's brain whether or not someone has a reading disability.**

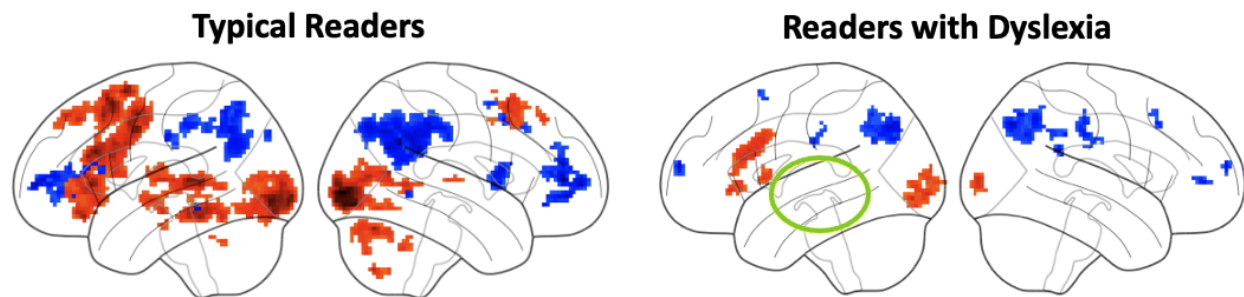


The brain activity above is from a **morphological awareness** task. Morphology describes the smallest units of meaning in a language. There is some evidence that struggling readers might be able to use morphology to support their word reading skills.

For this task, children read three words like *dancer*, *farmer*, *corner*, and were asked to decide which two words shared a piece of meaning. In this case, *dancer* and *farmer* both share the meaningful *-er* suffix that modifies a verb (a dancer is a person who dances, and a farmer is a person who farms). *Corner* ends with *-er* but it doesn't share the same meaning (a corner isn't a person who corns).

\*\* A, B, and D are typical readers. C has dyslexia. E and F have both dyslexia and ADHD.

While individuals cannot be diagnosed with a reading disability via a brain scan, we find differences *on average* when looking at many readers with and without dyslexia:



This image separates a group of typical readers and a group of readers with dyslexia who participated in our study and shows their brain activations during the morphological awareness task. The regions in red are areas of the brain that are more active when children are reading and thinking about words that share meaningful units (e.g., *dancer* and *farmer*). The regions in blue are more active when children are reading words and deciding if they match, like *blanket* and *blanket*, and are NOT paying attention to meaningful units.

A discovery emerging from our study already is that a region of the brain, circled in green, shows differences between readers with and without dyslexia. Readers with dyslexia aren't activating an important part of the language network (left superior/middle temporal gyrus) that is usually involved in processing the sounds and meanings of words. This is one of the first studies on the brain basis of morphology and we are eager to learn more! Thanks to you and your family, we are exploring how diverse readers may understand words in potentially different ways.

### What happens in the READ Study next?

To date, we have started to observe patterns in brain activations that may differ across readers. These results are preliminary, and we will need to increase the number of participants in order to draw more conclusive findings in the future. We have 4 years left of the READ Study to keep collecting data, and one successful year just completed! If you know any other 2<sup>nd</sup>-5<sup>th</sup> graders who might like to participate in our study, please refer them to this website to **sign up**: [bit.ly/MIT-reading](https://bit.ly/MIT-reading).

### Thank you!

We are so grateful that you and your family are helping us to understand how children learn to read, and why some children struggle more than others. The READ Study is set up to be the **largest and longest neuro-cognitive study of dyslexia in the U.S. to date** and we couldn't do this without you!

We can't wait to see your family again next year to see how your child has grown. If you want to know more about literacy, learning disabilities, or cognitive development, we are here to answer your questions and help you find resources for your child to succeed.

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