

MRI shows association between reading to young children and brain activity

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Credit: Robert Kraft/public domain

Among the advice new parents receive is to read to their babies early and often. The hope is that sharing books together will help children's language development and eventually, turn them into successful readers.

Now there is evidence that reading to [young children](#) is in fact associated with differences in brain activity supporting early [reading skills](#). The research will be presented Saturday, April 25 at the Pediatric Academic Societies (PAS) annual meeting in San Diego.

"We are excited to show, for the first time, that reading exposure during the critical stage of development prior to kindergarten seems to have a meaningful, measurable impact on how a child's brain processes stories and may help predict reading success," said study author John Hutton, MD, National Research Service Award Fellow, Division of General and Community Pediatrics, Reading and Literacy Discovery Center, Cincinnati Children's Hospital Medical Center. "Of particular

importance are brain areas supporting [mental imagery](#), helping the child 'see the story' beyond the pictures, affirming the invaluable role of imagination."

Professional organizations such as the American Academy of Pediatrics and advocacy groups have encouraged parents to read to their children from birth to foster early learning and create connections in the brain that promote [language development](#). Direct evidence of effects on the brain, however, were not previously available.

To show whether reading to preschoolers affects brain networks that support reading skills, Dr. Hutton and his colleagues studied 19 healthy preschoolers ages 3-5 years old, 37 percent of whom were from low-income households. Each child's primary caregiver completed a questionnaire designed to measure cognitive stimulation in the home. The questionnaire looked at three areas: parent-child reading, including access to books, frequency of reading and variety of books read; parent-child interaction, including talking and playing; and whether parents taught specific skills such as counting and shapes.

The children then underwent functional magnetic resonance imaging (fMRI), which measured brain activity while they were listening to age-appropriate stories via headphones. The children were awake and non-sedated during fMRI, and there was no visual stimulus. Researchers were interested in whether there would be differences in brain activation supporting comprehension of the stories in areas known to be involved with language.

Results showed that greater home reading exposure was strongly associated with activation of specific [brain areas](#) supporting semantic processing (the extraction of meaning from language). These areas are critical for oral language and later for reading.

Brain areas supporting mental imagery showed particularly strong activation, suggesting that visualization plays a key role in narrative comprehension and reading readiness, allowing children to "see" the story. "This becomes increasingly important as children advance from books with pictures to books without them, where they must imagine what is going on in the text," Dr. Hutton said.

The associations between home reading exposure and [brain activity](#) remained robust after controlling for household income.

"We hope that this work will guide further research on shared reading and the developing [brain](#) to help improve interventions and identify [children](#) at risk for difficulties as early as possible, increasing the chances that they will be successful in the wonderful world of books," Dr. Hutton concluded.

More information: Dr. Hutton will present "Parent-Child Reading Increases Activation of Brain Networks Supporting Emergent Literacy in 3-5 Year-Old Children: An fMRI study" from 12:15-12:30 p.m. PT Saturday, April 25. To view the study abstract, go to http://www.abstracts2view.com/pas/view.php?nu=PAS15L1_1355.8

Provided by American Academy of Pediatrics

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