

Kid NeuroLab NeuroNews

Issue 2

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About the Kid NeuroLab

What can we know about the mind of a child?

The Kid NeuroLab at the University of Rochester studies how children represent numbers, letters, and everyday objects.

The Kid NeuroLab aims to shed light on the origins of the human mind. In particular, we study the origin of concepts that are central to uniquely human culture, such as reading, music, and mathematics.

The Kid NeuroLab studies questions such as:

What do children know about numbers before formal schooling?

How does a child's brain respond to letters of the alphabet before the child can read?

We study children in order to understand how such concepts are formed in the mind and how they change over the course of human development.

Our lab offers two types of studies:

In our behavioral studies, kids win prizes for playing games with our researchers. Some games involve using a touchscreen computer, while others may involve cards or blocks.

In our brain scan studies, kids play games and watch movies from inside a functional magnetic resonance imaging (fMRI) scanner. fMRI is a safe and non-invasive research method that lets us take pictures of kids' brains and see how kids' brains respond to what we're showing them or having them think about.

Kids who participate in brain scan studies win prizes and get a



Research staff of the Kid NeuroLab teach kids about brains at the Rochester Museum and Science Center

picture of their brain!

The answers to our research questions will make important contributions towards discovering when and how sophisticated aspects of human culture come to exist, a question that is fundamental to our understanding of what it means to be human.

The Kid NeuroLab is headed by Professor Jessica Cantlon. We are in the University of Rochester's Department of Brain and Cognitive Sciences and the Rochester Center for Brain Imaging.

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The Kid NeuroLab

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Our Inaugural Year



Professor Cantlon thinks about science

A lot has happened in the past year! I moved to Rochester to start the Kid NeuroLab in July of 2009. Back then, we had no furniture, no computers, no participants - we didn't even have a name yet!

Building a brand new lab took a lot of work. There was equipment to order, experiments to design, grant proposals to write, and, of course, toys and prizes to purchase. We also worked hard to recruit and train our student research assistants, many of whom had their first

exposure to conducting research in the Kid NeuroLab.

Now, just over a year later, we've had over 200 children come in to participate in one or more of our studies. The Kid NeuroLab now boasts 2 full-time lab managers, a gaggle of undergraduate research assistants, its first graduate students, and substantial long-term federal funding (see below).

I owe many thanks to many people for getting the Kid NeuroLab to where we are today:

Thank you to the daycare directors and school principals who helped us distribute our flyers and letters so that parents would know about our lab. I owe an extra big thank you to Debra Ross and her Kids Out and About newsletter for helping us get the word out and for being an enthusiastic champion for participation in science.

Thank you to all of the parents

who have entered their children into our participant database. We thank you for your patience and hope to get to meet you soon!

And finally, thank you to the parents and kids who have already come in to participate in our experiments. We're grateful that you took the time to visit us, as we would be nothing without your help.

We have grown tremendously in this past year, and we hope to continue to build on our success this coming year. With your help, we can continue our efforts to understand the world of the child.

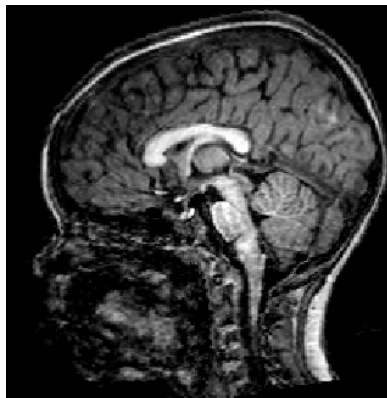
A handwritten signature in black ink that reads "Jessica Cantlon".

Jessica F. Cantlon, Ph.D
October 2010
University of Rochester
Brain and Cognitive Sciences

Good News for the Lab!

We are pleased to announce that Professor Cantlon has been awarded an R01 Grant from the National Institute of Child Health and Human Development (NICHD).

This grant will provide up to \$250,000/year for 5 years for Professor Cantlon and the Kid NeuroLab to study "The Neural Organization of Quantitative Concepts in Early Childhood".



The brain of a 4 year-old Kid NeuroLab participant

The mathematics abilities that children possess at a young age (even in preschool) affect their ability to learn math for the rest of their lives. This grant will enable us to use brain imaging techniques to study the math abilities of young children, so that we can understand what causes math abilities to develop normally and what causes them to be impaired.

Sesame Street and Brains

Good news for families that are fans of educational television!

In our Kid Video Clips study, we recruited children between the ages of 4 and 10 to participate in a brain scan study. Using fMRI, we monitored the brain activity of our participants as they watched a movie of clips from Sesame Street and Schoolhouse Rock.



A clip from our "movie"

The movie, which featured clips about numbers and math, engaged areas of kids' brains that are important for doing math in adulthood, even though kids were just passively watching the movie and given no specific task to do.

Educational television may not replace good old-fashioned math lessons, but they can engage math-related areas of kids' brains!

The results from this study have been presented by Professor Cantlon and researchers at the



A participant practices staying still in our mock scanner

Kid NeuroLab at conferences in Rovereto, Italy and Paris, France.

Many thanks to the kids who came by to participate in our study. We hope you enjoyed the movie!

Meet the Grad Student

Bobby Emerson got his bachelor's degree in Cognitive Psychology from the University of North Carolina at Chapel Hill. After graduation, he spent a year working in the Psychology department of the University of Texas at Austin before joining our lab in 2009 as a full-time lab coordinator.

Now, Bobby is continuing on in our lab as a Ph.D. student in the Department of Brain and Cognitive Sciences. We're glad that he's sticking around!



Bobby strikes a pensive pose

Here's what Bobby has to say: "I'm looking forward to using fMRI to explore the development of the mind in young children. Specifically, I'd like to look at the neural relationship between their math and language skills and investigate the brain areas that contribute to their development before and after school experiences.

I plan to eventually use my Ph.D. research at the U of R to look at ways to improve cognitive recovery in patient populations, design effective teaching methods for children, and design effective cognitive therapy for children with developmental disorders."

Did You Know That...

Bobby is an avid volleyball player. You can catch him on the court most nights of the week.

What's Next?

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Ongoing and Upcoming Studies

Number and Size

We are currently running a behavioral study on how children between the ages of 3 and 6 compare the number of things and the size of things. Kids who participate in this study play math games, card games, and a touchscreen computer game.

Thinking About Thinking

This currently ongoing behavioral study examines if children between the ages of 3 and 7 reason about their own thinking. Kids who participate in this study play math games, picture puzzle games, and a touchscreen computer game.



Thinking About Relationships

This upcoming behavioral study will be for older children between the ages of 7 and 11. We are interested in how kids reason about the relationships between things. Kids who participate in this study will play picture puzzle games and a touchscreen computer game.

Studies for Twins

We are currently looking for fraternal and identical twins between the ages of 3 and 11 to come participate in a brain scan study. Twins who participate in this study will watch movies and play computer games from inside an fMRI scanner.



We are also looking for fraternal and identical twins between the ages of 3 and 11 for an upcoming behavioral study. Twins who participate in this study will play math and picture puzzle games, along with some touchscreen computer games.

If you know any twins, please help us spread the word by telling them about our lab!

Learning to Read

This upcoming brain scan study will investigate the brains of children who are just learning to read and write. Kids who participate in this study will watch movies and play computer games from inside an fMRI scanner.

Tell your friends!

We're always looking for kids between the ages of 3 and 11 to join our participant pool.

Participants in our behavioral studies receive \$10/hour, plus stickers and prizes. Our behavioral studies typically last about an hour.

Participants in our brain scan studies receive \$25/hour, plus prizes, an "I saw my brain!" t-shirt, and a picture of his or her brain. Our brain scan appointments typically last about 2 hours, but the scanning portion is less than 1 hour long.

Help us spread the word about our lab. Tell your friends to contact us today!

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Just some of the many prizes that participants get to choose from!