

Language, Reading & Math in Children

A study of the skills that support children's learning

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EARLY SCREENING OF CHILDREN'S LEARNING

We've been developing a Kindergarten screening tool that will help us identify the skills most needed for school learning of language, reading, and mathematics. We've screened nearly 400 children, and some of them are now in grade 1 or 2. Preliminary analysis of the data tells us that we're on to something! Tasks on our screener like asking a child to repeat a sentence, name letters, or say the sound a letter makes tell us a lot about what that child's reading will be like. Other tasks such as deciding which of two numbers is larger tells us something important about a child's later math skills. These results are promising! As a quick screener for early educators, this tool could help in identifying the varying abilities of students in language arts, literacy, and numeracy. As well, the screener could be important in the early identification of children who would benefit from targeted educational interventions. - Zachary Hawes, BSc, and Lisa Archibald, PhD.

OUR BRAINS AT WORK!

When we listen to spoken language, our brains have to work hard to process speech sounds quickly and efficiently to recognize words. Did you know that most sounds in a word carry information - "speech cues" - that tells what the next sound will be? We wanted to know whether people use these speech cues, so we used a special computer that tracks eye movements. Children and adults in our study looked at pictures on the eye-tracking computer while they listened to words that were recorded with mismatched speech cues. We found that both children and adults were tricked by our mismatched speech cues! They took extra time to look to the right picture when a mismatch speech cue was present. This suggests that both children and adults use speech cues to process speech more efficiently. We also found that children's ability to recognize speech cues related to their reading and language abilities. Children who had more difficulty with reading and language tasks didn't respond to the subtle speech cues as much. - Alex Cross, MSc.

**WISE WORDS:****DO YOU KNOW THESE WISE WORDS?**

Graduate students training to be speech language pathologists worked with children at the Boys and Girls Club of London in the Junior M.A.P. (My Action Plan for Education) program. The children completed our 'Wise Words' vocabulary building project. They learned new words by listening to stories, and talking about word meanings and word endings.



You can view our Wise Words stories on our YouTube channel:

<http://bit.ly/1QjA4Jj>

NEUROIMAGING META-ANALYSES ON BASIC NUMBER PROCESSING

The ability to process numbers (such as understanding that '4' represents four objects) is a critical foundation for learning math. Many researchers have used brain-imaging technology such as fMRI to study how the brain processes numbers. One way to look at patterns across many studies is to use a statistical technique called 'meta-analysis'. We used a neuroimaging meta-analysis tool to see which brain regions were consistently reported to be important across more than 60 basic number processing studies. We found that adults and children have some brain regions that are important for a variety of basic number processing, and some that are important for very specific kinds of basic number processing. Adults and children use some of the same brain regions to process numbers, but also use different brain regions to perform this task. In the future, studies like this one could help identify individual differences in math ability at an early age.

- **Moriah Sokolowski, MSc.**

A SPECIAL THANK YOU!

Thank you to all of the school personnel, parents, and children who make our studies possible. Thank you also, to the talented graduate students working on these research projects!

**SPEECH PERCEPTION:
BEING AWARE OF THE SOUNDS YOU HEAR**

When we learn language, our brains process sounds very quickly so we can gain all the information we need. Some children have difficulty learning language. We wanted to know if these children have difficulty processing sounds quickly enough. We use two fun tasks: In the Bird Task, children decide which bird chirped slowly.



In the Benny Bee Task, children decide whether Benny the bee got to the flower before his friends.



These tasks let us compare how children process sounds compared to how children process other information. We're looking at whether slow processing of sounds is related to language learning, or is more related to overall slow processing.

- **Rachael Smyth, MSc.**

HIGHLIGHTS FROM OUR OTHER STUDIES

- Over 20 infants took part in a study of word learning
 - Infants indicated their surprise by looking longer at new words
 - Infants showed better learning of words said with emphasis
- Some children told stories & did memory tasks either with practice or without
 - After working on re-telling stories for 5 weeks, children produced more complex sentences
- Some children did music & language tasks
 - Remembering words and music are related skills

**WE'RE STILL WORKING**

Thank you to all of the parents who have indicated that they would like to be contacted for future studies. As we continue working on our research projects, we greatly appreciate your continued participation.

FIND OUT MORE ABOUT OUR RESEARCH!

Follow the links to find out more about our work:

Our past newsletters: <http://www.uwo.ca/fhs/lwm/newsletters.html>

Podcasts about our research: <http://www.uwo.ca/fhs/lwm/index.html>

Lists of our published papers can be found at the lab website listed below.