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Language, Reading, & Math in Children

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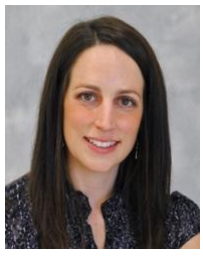

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A study of the skills that support children's learning

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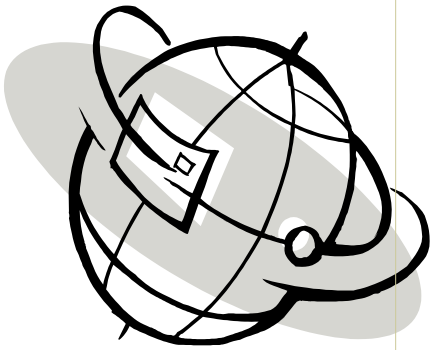


Early Screening of Children's Learning

Over the past 3 years, we have had nearly 800 kindergarten children join our study of early predictors of children's learning. All of these children completed several tasks in kindergarten including: picture naming, sentence repetition, letter, sound and number naming, rapid naming of colours and letters, judging the larger number or array of dots, judging where a number fits on a line, and some simple addition & subtraction. This year, we'll be asking the children in our study who are now in grades 1, 2, or 3 to do some listening, talking, reading, and math activities. Past research tells us that our early screening tasks are good predictors of children's school learning. In our study, we're examining how these tasks predict reading, math, and other school learning over grades 1 to 3. We're interested to know if the way these tasks help us understand learning changes across these grades.

Lisa Archibald, Ph.D.
Associate Professor

The link between reading and arithmetic

Reading and arithmetic are important skills that children learn in the first years of primary school. Although they may seem like very different skills, children's performance on reading and arithmetic is in fact highly correlated: Children who perform well on one skill tend to also perform well on the other.

We are currently studying which factors at the behavioral and at the brain level drive this similarity between reading and arithmetic. To do that, we ask children 10 to 14 years old to do a series of arithmetic, reading and other cognitive tasks. Children also do exercises in a scanner that safely measures the magnetic resonance of their brain. The MRI scan allows us to investigate what happens in the child's brain during reading and arithmetic. On top of that, we also investigate these same things in children's biological mothers. We do this, because there are genetic factors influencing reading and arithmetic.

This project will allow us to investigate which factors explain why children perform the way they do on arithmetic and reading tasks, what happens in the brains of children while they perform arithmetic and reading tasks, and how parental factors influence children's abilities. Studies like this help us to better understand why some children struggle with arithmetic and reading, and how we can help struggling learners.

Lien Peters, Ph.D

Can music help language learning?

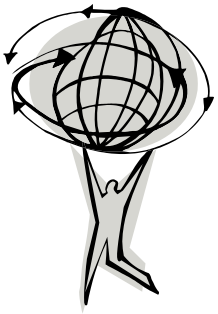
Music and language are similar in a lot of ways, but music has a more predictable rhythm than language as it unfolds in time. For instance, imagine how easy it is to clap along with a song compared to how hard it would be to clap along with a speech someone's giving—we wouldn't know where to clap! We wondered if the regular rhythms and musical melodies of song could help children better understand language. Children listened to sentences while we measured how well their brains tracked speech sounds when the sentences were spoken and sung. We found that adults' brains were better at tracking song than speech, which suggests that singing words could help listeners understand or perhaps remember language better. We are still wrapping up the study with 8- to 10-year-olds who have a range of reading abilities to see whether singing could be particularly helpful for children who struggle to read and comprehend language.

Christina M. Vanden Bosch der Nederlanden, Ph.D.

Analyzing the Quality of Online Resources Available for Parents of Children who are Late to Talk

The Internet (i.e., Google) has become one of the first places parents go to find answers to questions about their child's development. However, the quality of this information can be variable. We evaluated 54 webpages about late to talk children for their **usability** (i.e., how easy it is to navigate and use a website), **reliability** (i.e., if references are provided and if it is written by a credible author) and **readability** (how easy the content is to read and understand). We found that many of these webpages were fairly usable. However, many were not very reliable and were sometimes difficult to read. Most of the webpages were from the United States, written by speech-language pathologists, and were targeted to parents. The most common topics discussed were speech & language milestones, tips & strategies, and red flags. Webpages gave accurate information about speech & language milestones, however, several webpages gave incorrect facts about risk factors and causes. This study gives an idea of the kind and quality of information parents may be accessing online, and where gaps in information may be.

Caitlin Coughler, M. Sc.



What role does gender play in early math?

Who is better at math? Boys or girls? I get asked this question frequently when I tell people that I do research on children's early math learning or when I give research presentations to educators and parents. Many accounts in popular media suggest that boys are better at math than girls. Many of you may know the Barbie doll that states that "Math class is tough". Products such as this are propelling the notion that boys are better than girls at math. But what does the evidence tell us?

A review of the literature suggests that there is ***overwhelming evidence for gender similarities*** rather than gender differences. Put differently, large scale studies have shown that there are almost no gender differences on standardized tests of math achievement across grades. But what about the most basic numerical skills, such as being able to tell which of two numbers is larger?

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"there is overwhelming evidence for gender similarities."

We recently sought to examine this by looking at results from almost 1400 students in grades 1-6. We found that on almost all tests of fundamental number processing boys and girls do equally well. The exception to this rule was number line estimation. In number line estimation students are asked to determine the spatial position of a number on a number line. For example, you may show a student a number line from 1-10 and ask them where 6 goes. On this task we found that boys do better than girls. However, these gender differences were greater in the later grades, suggesting that at the outset of schooling girls and boys perform similarly on number line estimation too.

Our data, together with those of many other studies suggest that there is very little evidence for differences. It is important for teachers and parents to be aware that there is more evidence for gender similarities in early and later evidence than there is evidence for gender differences. We know that there are negative consequences for female students from having the stereotype that girls are worse at math than boys. We need to move away from these false opinions and heed the data. There is no reason for anybody to think that girls are inherently worse than boys at math. Boys and girls are equally capable of reaching their full potential in math.

Daniel Ansari, Ph.D.
Professor

Our Thanks!!

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!

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 this link to find out more about our work

Our past newsletters: https://www.uwo.ca/fhs/lwm/research/newsletter.html

List of our published papers can be found at the lab website:
https://www.uwo.ca/fhs/lwm/publications/index.html

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