Dear Learning to Talk Families and Friends,

This is an exciting time for the **Learning to Talk Lab** at the **University of Wisconsin-Madison**. We have finished up our "Timepoint 2" visits and have started on our "Timepoint 3" visits, which means we are nearing the home stretch for this project! In this newsletter we want to thank you for loyally sticking with us during this important project. Whether you have come for one set of visits with us or are participating in our 3 visit study, the success of our work depends on our children and families coming back to complete the study so that we can learn more about how children learn sounds and words as they grow. For example, we are excited to report that out of 122 families who visited the UW Learning To Talk Lab for our two year, 3 visit study, 118 have stayed with us for all of the visits! That is an amazing number of returning participants and we appreciate your commitment to our work!

It is always a pleasure to know that parents are interested in our work and we have enjoyed discussing the study tasks at each visit. Parents have been especially interested in the very first tasks that the children participate in during their visits – the eye-tracking tasks on the second floor. In this month's newsletter we would like to highlight the eye-tracking tasks and explain more about them to you. Then you will know even more about how something that is so much fun gives us so much scientific information! Can you believe that while your children are "watching movies," and "playing I-SPY" a computer is recording their eye-movements so that we can learn even more about the sounds and words they know? As you will see in the "Breaking News" section of the newsletter, we are starting to write about our findings from your visits. As always, we are grateful to you and your child for helping us find out more about the amazing process of **learning to talk!**

Yours,
Jan Edwards, Principal Investigator

Learning to Talk Lab– UW-Madison

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Special points of interest:

- *What is Eye-Tracking?*
- *What are some recent research findings from the L2T Lab?*
- *How can parents read more intentionally to their children?*

Inside this issue:

The eyes have it!

How Do Eye Tracking Tasks Teach us about Language Learning?

Tristan Mahr, PhD Graduate Student Researcher,
Department of Communication Sciences & Disorders
UW-Madison, Learning to Talk Lab

Thanks to your child's participation in our study, we are answering these important questions using Eye Tracking technology!

What do young children know about language?

For older children, we can study language directly; we can record them talking and ask them questions about

Image courtesy of Tobii Eye Tracking

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what they know. But what about very young children, say toddlers, or preschoolers who may be late talkers? Here things start to get tricky. We can see that these children certainly know a great deal of language, even though they cannot say very much yet. If we keep our questions and directions simple, we can figure out bits and pieces of what they understand. Now, what about *even* younger children? What do one year-olds understand when we talk to them? It turns out that the way to answer this question lies in the **eyes** of the child.

If we show children pictures of objects and then say the name of one of the objects, and if the kiddo reliably looks at the picture of the object we have named, it's a safe bet that the child understands that word. That's the big idea behind our eye tracking experiments: we play some speech, and because the eye tracking equipment is so precise, we can watch where your child looks as each part of the word is being said—not just when they "hear the word." This is a very precise measurement not just of "right" or "wrong" but of *when* children decide "what word did I just hear?"

An important question for us is how much information do children need to make a decision? Do they need the first, middle and last sounds to be sure of what they hear? Or do they decide when they have only heard part of a word? For instance, when children sit in front of our eye tracker, see two pictures, one of a **dog** and another of a funny-looking animal that is **not a dog**, and then they hear the word "dog," we can track which picture they are looking at as they hear the "d", as they hear the "aw", and finally as they hear the "g." Using this technique, we can study your child's comprehension of words *in real-time*! This is very exciting information for us to have because we can then study what children do to learn words with the sounds that they hear.

"...when children sit in front of our eye tracker, see two pictures, one of a dog, and another of a funny-looking animal that is not a dog, and then they hear the word "dog," we can track which picture they are looking at..."

Lights, cameras, eyeballs!

But how do these eyetracker devices work?

The eye tracker equipment has to work out to two problems. First, the device has to **find the eyes**—and not find, say, the black polka dots on my shirt—and second, the eye tracker has to figure out **where** the eyes are looking. This first problem is solved by using **infrared light**. The pupils become easy to see because they become brighter than the rest of the eye under infrared illumination. Scientists say the pupils "pop" (they are easier to see) so that the eye tracker can reliably find the eyes. It's similar to the principle behind the red-eyes we see with flash photography—a light source makes the eyes stand out, or "pop" in a special way. The good thing is that eye tracker technology is much easier on the eyes than flash photography!

For the second problem, we rely on the **reflections on the cornea**—the clear "front window" of the eye—to figure out where the child is looking onscreen. At the beginning of each experiment, we calibrate the device by having the child look at different areas on the screen. This is when we ask the child to "follow the red ball with your eyes," or "find the ducky!" The eye tracker creates a model of the child's eye at the beginning of the experiment, and it calculates the child's gaze location by monitoring how reflections on the cornea shift around the pupil. With the eye tracker equipment the eyes are a window into how children learn sounds and words: the eyes have it!

Breaking News!

Results from the Learning to Talk Lab

Franzo Law II, PhD
Post-Doctoral Researcher
UW-Madison Departments of Psychology and Communication Sciences

Thanks to our participant children and their families, we are excited to report that in 2014 The Learning to Talk Lab published the article titled ***Effects of Vocabulary Size on Online Lexical Processing by Preschoolers*** in the academic journal, ***Language Learning and Development!*** This article describes the first results of our ongoing quest to understand how children learn to talk. In this article we took the results from the Eye Tracking tasks to help us understand how children use sounds to learn new words. We are happy to share these fascinating results with you!

We know that when children hear a word they have to do a number of things to understand what they have heard. With the eye-tracking tasks we are looking at the different things children must do to learn about words. One thing we know they must do to learn words is recognize whether a word they hear is one that they already know. For example, if they hear "Find the ***baby,"*** they have to think, "That is a word I am sure about and there is the picture of a baby, so I will look at the picture of the baby!" Another thing they must figure out is whether a word that sounds like a word they already know is actually a **new** word. For example, if they know the word ***baby,*** but hear the word ***maybe,*** they have to figure out if ***maybe*** is a different word than ***baby*** even though the 2 words sound alike. A third thing children must do is figure out if the word they heard is a **mispronunciation** of a word they already know. For example, if they hear ***Vaby*** they have to decide if they are hearing someone saying the word ***baby*** incorrectly.

Images such as this manolo (top right) and food pod (bottom left) are examples of unfamiliar images that we may use in our eye tracking task.

Many other studies before us have focused on correct/incorrect responses in determining whether a child knows a word; either they know it or they don't, and their correct or incorrect responses were counted. However, we are interested in digging deeper into understanding what it means to **know** a word. Our eye tracking tasks allow us to measure, not just whether a child recognizes the name when they hear it of an object in a picture we show them, but **how long** it takes for the child to look at the picture of the object they have just heard someone name. The "how long" gives us much more information than just "right or wrong."

We know that children need to learn a lot of new words quickly at a young age. We wanted to explore even more about this process of word learning by using tasks that pair nonsense words with pictures of unfamiliar objects: objects that most toddlers and pre-schoolers don't know. In other words we set up in the Learning to Talk Lab visit a situation just like children come across in the real world as they learn language: how do you learn the name for something you don't have a word for yet? In the Eye Tracking tasks we were curious to see whether children look away from a familiar image and to an unfa—

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-miliar image when they hear a nonsense word that they have not come across before. Indeed, our results show that children look to the familiar image when they hear its name, and they look to the unfamiliar image when they hear a nonsense word!

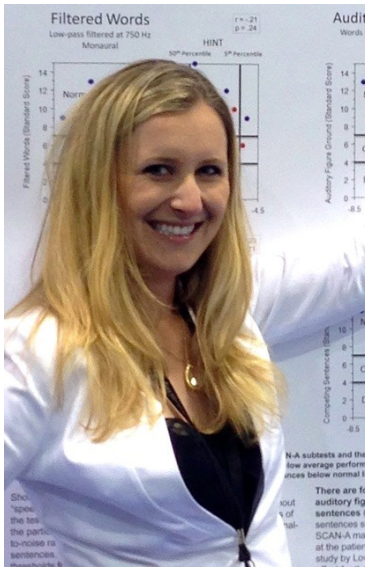
Finally, we looked at how children respond to **mispronunciations** of words they know. We found that children did have different looking patterns on the eye tracking tasks when they heard mispronunciations, compared to when they heard correct pronunciations of words they know. This tells us that children are sensitive to differences in smaller **pieces** of the word, which is an important skill for learning new, words that may sound alike, as in our ***Baby*** vs. ***Vaby*** example.

Finally we were interested in how children's vocabulary size and word skills go together. Do children with larger vocabularies have faster, more accurate looking patterns on the eye tracking tasks? Our results answered, "yes!" That is, our results showed that although **all** our children were successful at correctly completing our eye tracking tasks (correct or incorrect), two things were different for children with larger vocabularies than their peers: they were **faster** and more **accurate** at word recognition, and they were better at detecting mispronunciations. Therefore, our results suggest that children with smaller vocabularies than other children their age, are at a disadvantage because they don't do two things as well as other children their age: they don't learn new words as easily as children with larger vocabularies, and they don't do as well at recognizing words they already know. This is an interesting finding because we know that children who are successful in school come to school with the vocabulary needed to be "school ready" for reading and writing success. The eye-tracking tasks have helped us look at how young children begin this important task.

Team Member of the Hour

Michelle Minter

Speech-Language Pathology Graduate Student/UW-Madison Department of Communication Sciences and Disorders



In this newsletter we are highlighting and saying farewell to Learning to Talk Graduate Student Researcher Michelle Minter. She has been with the lab almost 2 years, and is completing her Master's Degree in Speech-Language Pathology this semester. In her time at Learning to Talk she has had a big effect on all aspects of our work from designing visits, training new examin-ers, constructing experimental tasks, monitoring equipment, recording and other production logistics, and most importantly as an examiner making visits fun and productive for all children and their families!

Michelle is from Valencia, CA and earned her BA in Film and Television Production at the University of Southern California. Subsequently, she worked on a variety of projects ranging from reality television to film, finally ending up in children's programming for Nickelodeon. Ultimately, the excitement she felt when hearing about her show's positive impact on the communication abilities of its preschool viewers with developmental disabilities led to her decision to return to school and pursue a career as a Speech-Language Pathologist. While attending UW-Madison, her interests within the field have grown and evolved as she has gained understanding about the broad range of opportunities available.

When she graduates from Madison in May 2015, she is interested in pursuing a position working with adults with acquired neurocognitive disorders. She feels working in a hospital setting helps combine the fast-paced lifestyle she enjoyed in television with her interest in Speech-Language Pathology. Outside of professional aspirations, she is also hoping that she and her husband can expand their family by adopting a puppy in the near future.

Michelle says, "The people at L2T are among the most impressive I've encountered during the entirety of my education, both in their individual talents and support for one another. It's been an honor to be their colleague, and I'll miss working with these friends upon graduation."

The Learning to Talk Lab says, "We will miss you MM! We can't imagine going on without you, but know that you have trained us well. We will go forward, confident and ready for our visits because of all your hard work…."lights, camera, action!"

Reading Tips

Cara Donohue, Graduate Student/UMN and
Courtney Huerth, Graduate Student/UMN

Many parents regularly read with their children. Reading is a pleasurable activity that increases parent-child bonding. But did you know that reading with your child is also helps her **develop important pre-literacy skills?** Parents who read with their children stimulate their children's brain development and help create important neuronal connections. This, in turn, helps children develop pre-literacy skills such as **phonemic awareness, decoding, and vocabulary development**, all within a real word context. These pre-literacy skills are strong indicators for success in reading and overall achievement in school. Reading to children from an early age also fosters an intrinsic **motivation and passion** for books and learning. Here are some quick tips and guidelines for making reading with your child even more engaging and beneficial to their literacy development!

- **Ask questions** about the story that require more than a 1-2 word response (who, what, when, where, why, how, etc.)
- Ask them to **retell** part of the story using beginning, middle, end
- Read with **expression** (facial expressions and voice)
- Talk about what's happening in the pictures (**describe** what characters are doing, elaborate more than naming pictures and objects)
- Talk about **similarities** between the child's life and the characters in the book (i.e. Look! Both of you liking riding your bike and have green shoes.)
- Draw awareness to what **sound** certain letters make (i.e. Ssssss snake and sandwich have the hissy ssssss sound, see?)
- Play **sound games** with rhyming words or words that start with the same letter (i.e. Dr. Seuss books. Bat, cat, rat, sat- they all rhyme! Can you think of another one? Mouse, moose, maple- they all start with the same mmmm sound. Can you think of another one?)

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We Want You!
Participate in Dane County!

Interested in helping us improve methods for teaching young children? Join our research project! Our study looks at how young children learn sounds and words! Both you and your child can be involved!

Who can participate?

- Children who are 2-5 years old
- Children who are native English speakers
- Children who have normal hearing and are typically developing or have cochlear implants!

Families are paid for their participation and your child will receive a small toy and a book. Transportation (cab) will be provided if you would like it.

How do our studies work?

Sessions take place at the University of Wisconsin-Madison's Waisman Center, 1500 Highland Ave, Madison, WI.

Your child will participate in 1-3 sessions and the sessions last about 1-2 hours.

If you would like to learn more about our studies, please email us at learningtotalk@csd.wisc.edu, or call Nancy Wermuth at 608-263-0729, or visit our website, www.learningtotalk.org and enter your information on our **Participate** page.
We look forward to working with you!

Please pass this information on to family and friends who might be interested in this study.

Thanks!