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Dear Parents,

We greatly appreciate your participation as well as that of your child in our current research projects. Since January of 2016, the Language and Learning Lab has completed seven new projects and we could not have done it without your dedication and commitment. In this newsletter, we will look at the studies children completed and what we discovered.

If you would like to update your contact information with us or tell us about any new additions to the family, please visit our website (languageandlearninglab.com) and fill out the form linked under 'For Parents' or send us an e-mail (languageandlearninglab@gmail.com).

If you know of any friends or families that you think might be interested in participating, we would greatly appreciate your help in passing on our information on to them. We are always looking for new 'child scientists' to help us with our studies, and we could not do our work without the generous support of parents like you.

Sincerely,

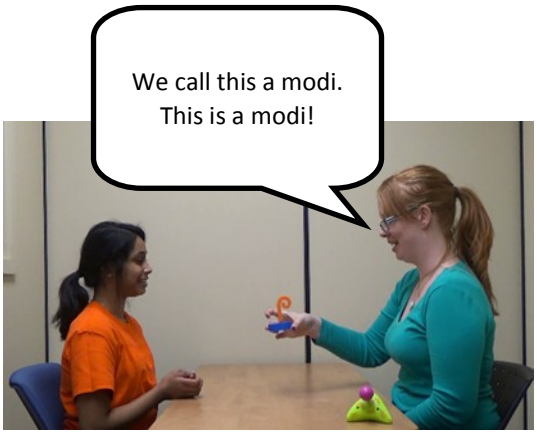
Language and Learning Lab Team
The University of Toronto

Inside This Issue

Do Young Children Expect all Labels to be Conventional?

Young children, as well as adults, will assume that someone who speaks the same language as them will refer to objects by the specific labels used in that language. For example if you show children a ball and an unfamiliar object then ask them for the "luga", they will give you the unfamiliar object as they already know the label "ball" and the object it is associated with.

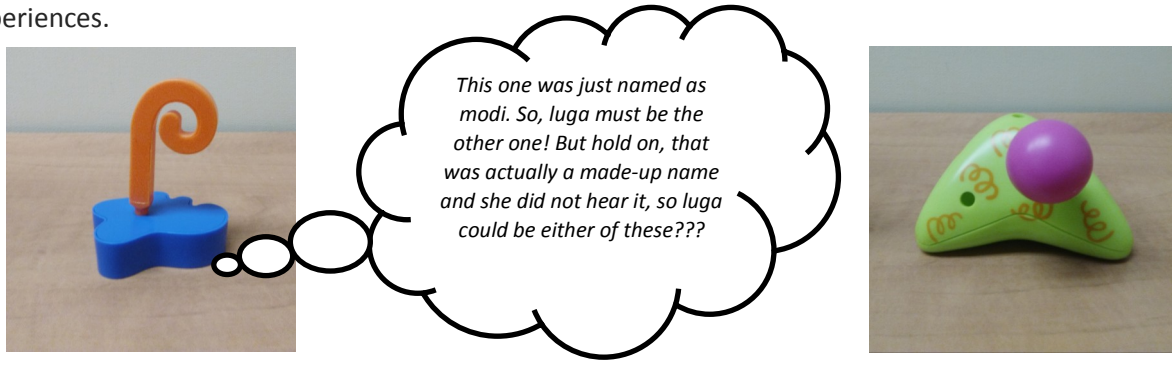
Children as young as two years of age are able to match new labels to objects in this way. Children will sometimes change their expectations about what the other person has in mind based on various contextual cues. In this study, we explored children's expectations for two unfamiliar objects when one of the objects is given a made-up label and upon a request from someone who was either watching the video with them or not.



Children watched a video in which two people played out a scene where they either made up a label for one of the unfamiliar objects or introduced it in a typical way.

After hearing the label "modi", children were asked to show the research assistant the "luga". Sometimes the research assistant watched the video with the child and sometimes she would leave the child to watch the video with their parents and return to ask them the question.

We found that starting at the age of three, children interpret made-up labels differently from typical labels. When the research assistant did not watch the video together with them, children assumed she did not know the made-up label ("modi"). Therefore, upon request for a differently labelled object ("luga"), children assumed that she could be referring to either of the objects. This study suggests that children show sensitivity to how objects are labeled and what other people have in mind based on shared experiences.



Will the Use of Electronic Books Replace Print Books in the Near Future?

In this study, we asked caregivers of children between one and four years old about their usage of print and electronic books. We also asked about the types of interactions that typically occur during reading.

Almost all of the caregivers in our sample (99%) reported regular print reading. However, less than half (43.8%) reported that their child had ever experienced an electronic book. Even among families where children read e-books, print books were read much more often and for longer periods.

Caregivers reported that their children not only read traditional print books more often than electronic books, but also enjoyed them more as well as paid more attention to them. They also reported participating in higher quality adult-child interactions while reading print books.

Caregivers who say the behaviour is typical…	…when reading print books	…when reading e-books
I point and label items	75.7%	34.1%
We stop to discuss the story	65.7%	25.8%
My child tells me familiar stories	43.9%	14.3%
My child points and labels items	71.5%	40.1%
My child turns the pages	71.5%	37.3%

Not only did caregivers report less usage of electronic books, but when they did use e-books, they did not engage with them in the same manner in which they engaged with print books. In future studies we would love to hear from parents about why that is. Do children's lack of enjoyment of electronic books result from the reduced level of adult interaction, or cause it?

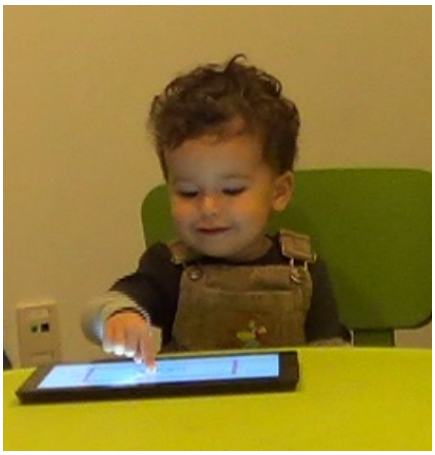
For children who did read e-books, parents reported that older children were more likely than younger children to read electronic books on their own. Electronic books do have features that allow children to be self-sufficient when it comes to reading, and research with school-age children shows e-books can be supportive of literacy skills.

Research with preschoolers and print books has shown that parent-child talk during reading is supportive of children's literacy growth. For example, stopping the story to discuss what is happening or having the child retell a story they already know or even simply labelling the pictures are all part of successful reading programs. These types of activities are very helpful for developing children's understanding of stories as well as their ability to learn new words.

Congratulations to our media questionnaire winner, Nicole McLellan !

Do Interactive E-Books Support Toddlers' Learning?

When children engage actively in learning, they often learn more. As a result, e-book and app designers may include many hotspots - interactive areas on the screen that can be touched to make things happen – in an effort to engage children with content. However, there is some research evidence to indicate that sometimes manipulative features – like the ability to lift a flap or pull a tab – can be distracting to children when reading print books. In this study we were interested in whether hotspots would be distracting to or supportive of toddlers' learning from an e-book.



Ninety-eight toddlers ages 19 to 23 months listened to a narrated e-book in which the narrator "liked" either an unfamiliar object labeled the "dax" or an unfamiliar object labeled "this one." After each labeling, the narrator requested the child to "touch the dax" or "touch the one I like" before continuing to the next page. Toddlers listened to 1 of 4 different books:

BOOKS	LEARNING
No hotspots: A book much like a movie in which the book pages turned regardless of the infant's touch response	**No**
Distracting hotspots: A correct touch response triggered a child-friendly noise and animation unrelated to the label + a page turn	**No**
Neutral hotspots: A correct touch response trigged simply a page turn	**Yes**
Supportive hotspots: A correct touch response triggered a "good job!" + page turn	**Yes**

Children were then asked to identify the "dax" both on the touchscreen and from the pair of actual, physical objects that had been pictured in the book.

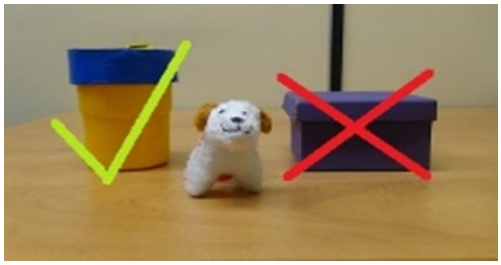
Neutral and supportive hotspots resulted in learning. Distracting hotspots resulted in no learning, similar to when children watched the book with no hotspots at all.

In summary, when hotspots were aligned with the content and the learning goals of the book, and did not distract from the information presented, children learned well. This study shows not all hotspots are created equal. When learning is the goal, adults may wish to choose e-books and apps that offer simple hotspots that are clearly related to the content being learned.

Can Toddlers Use Negation to Make Logical Inferences?

At around 1.5 years old, toddlers often use words such as “not” and “no” in their own speech. Previous research has shown that older children (4-6 years of age) can reason by elimination when given visual information. For example, when searching for an item, if they are shown that one location is empty, they will expect that there is a greater likelihood of the item being in the remaining alternative. In this study, we were interested in finding out whether younger children (2 years of age) could reason by elimination using only verbal information.

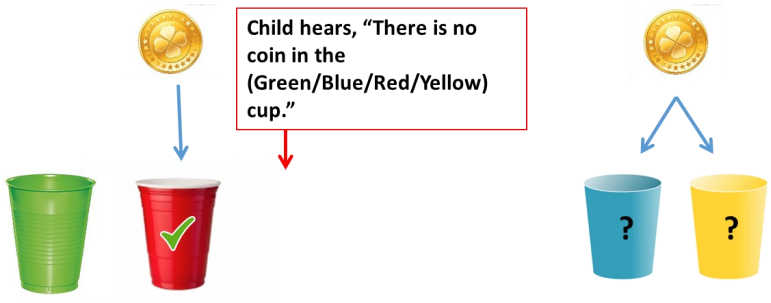
Children played a series of hide-and-seek games with a toy dog named George, who “liked to hide in all sorts of places”. In **Affirmative Trials**, children were directly told where George was hidden (e.g., “George is in the cup.”) In **Negative Trials**, they were told, where George was not hidden (e.g., “George is not in the box.”) and had to infer that he was in the remaining location. In **3-Location Trials,** children were presented with three containers, and told that George was not in one of them, and shown that a second container was empty. They had to combine this information to infer he was in the last container.



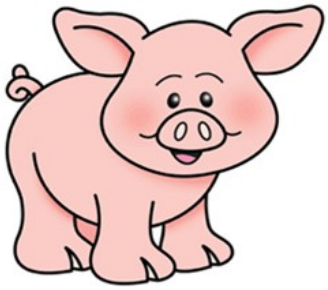
While most children in both age groups had no difficulty finding the toy using affirmative phrases, making the correct inference using negative statements was more difficult. Only older two year olds (34-35 month olds) did better than expected by chance on negative and 3-location trials. All children also performed significantly better on affirmative trials compared to negative trials. These results suggest that younger two year olds (23-24 months old) still have an immature understanding of negation. For younger two year olds, hearing negation isn’t the same as seeing the equivalent visual information (seeing empty), and it is harder for them to make inferences using language.

Follow up study (Started October 2016)

In the above study we saw that older 2-year olds correctly searched for hidden objects when we gave them verbal information that ruled out one possibility. In the follow up study we will test whether or not 3-year olds are able to engage in logical thinking to solve a more complex version of the task. In the new version, the child must infer the correct location of a target between four possible cups. Children who have the ability to engage in logical thinking will infer that the target’s location is certain only in one of the two pairs. Children who have yet to develop this ability are predicted to search other alternatives equally.



Do Children Engage More With Picture Books or Electronic Books?



The environment in which children hear language is an important factor for their language learning. In particular, when parents and children interact with a book – for instance, when parents ask questions and children reply, or parents direct children's attention by pointing - this dialogue between parents and children supports children's literacy and vocabulary growth. Children's emotional engagement in reading is also important in these shared experiences.

Research with school-age children has demonstrated that electronic books carry some benefits for develping literacy skills, including word reading and story comprehension. Now that electronic books are available for very young children, we wanted to know the effects that the book medium – print or electronic – had on parents' interactions with their 17-26 month-olds and the amount children learned from these books.

We selected two very similar commercial e-books - one about familiar farm animals and one about less familiar wild animals – and asked parents to read the books to their child, without the researcher in the room. Some parents read an e-book with music, animations, and a voiceover, and other parents read traditional print book which was a bound copy of screenshots from the e-book. A third group did not read the books at all. We recorded the parent-child interactions during reading. Then, at the end of the session, the researcher asked the child to identify a named animal from the book in a set of three animal pictures.

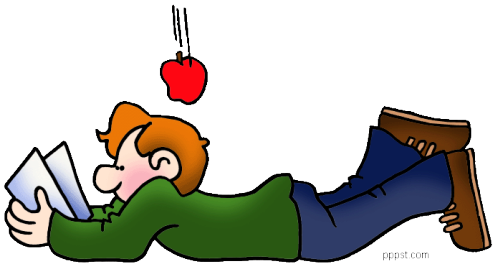
Children engaged more with the electronic books. Overall, children and parents spent twice as much time with the e-books than with the print versions. Even after taking this extra time into account, children paid more attention, were more available for reading, showed more positive feelings towards the book, and were more engaged in page turning.

There was some evidence that electronic books supported children's learning by way of increasing their engagement and attention with the material. However, in general children who read these books did not learn more animal names than those who did not read any books. It is likely that children would need to read the book multiple times to learn the animal names effectively.

We think that before we can address whether a specific book format is more supportive of children's learning than another for younger children, we need to find out more about whether the things we saw – increased time, engagement, and attention – really endure over time and outside the lab setting, and whether, in the long run, they lead to increased learning. We also believe that all electronic books are not created equal. We need to learn more about how 'hotspots' and other enhancements in the books may influence children's experiences with these books as well as the amount they learn from them.

Can You Teach Children About Gravity? Updated Results!

In this study, we observed whether young children can learn a physics concept from a realistic fiction book or an informational book. This study was presented in our previous newsletter. However, after obtaining the results, we decided to test some more children to examine the difference between narrative and informational books more closely.



We designed two books that taught the concept of gravity and objects falling. The books had the same illustrations and were similar in reading levels, but one taught the concept using factual statements and situations, while the other book built these facts into a narrative story about two children named Alice and Luke. Children were read either a realistic fiction, an informational book or a book about plants. Before and after reading the book, they were presented with two objects and asked "If you hold the objects out like this and let them drop, will both the objects fall at the same time or will one of the two fall faster?" We predicted that if the children learned from picture books ,they would be able to answer more questions correctly after reading the book.

Previously, our results had suggested that while both 4- and 5-year-olds could learn that objects of similar sizes fall at the same time regardless of weight, only 5-year-olds could learn from both informational and narrative books, while 4-year-olds only learned from the narrative books. However, further testing revealed that 4-year-olds were also capable of learning from informational books. Children did learn about gravity from both genres, but children who read a book about plants did not learn about gravity. Thus, our updated results tell us that both 4-year-olds and 5-year-olds are capable of learning from both realistic fiction and informational books.

Current Studies

Learning from Videos
28 months to 30.9 months

Can children use information from videos in real life with repetition and adult support? Your child will watch three short video clips of a person hiding a toy and then will be asked to find it in real life. This will involve one 20 minute visit to our lab.

Learning from Fantasy and Reality
4 and 5 year olds

Can children learn science concepts from different types of books? Children will be read either a fantasy or reality book and then asked some questions about the pictures and props. This will involve one 30 minute visit to our lab.

Counterfactual Reasoning
5 and 8 year olds

Can children think about past scenarios and how they could have turned out differently? Children will hear four short stories and be asked questions about their endings. This study will involve one 15 minute visit to our lab.

Tracking Characters across Stories
28 months to 32.9 months

Can children use verbal information to figure out what has happened in a story? We will watch two short movies in which a character plays hide and seek and we want to see if your child can track them. This study will involve one 30 minute visit to our lab.

Learning Implicit Messages
5 year olds

Can children understand implicit messages conveyed during communicative interactions? Your child will watch a series of prerecorded videos and be asked questions about the outcome of these videos. This will involve one 15 minute visit to our lab.

Understanding Storytellers
6 year olds

How do children understand storytellers' intentions? Children will watch a story on the computer and be asked questions about the end of the story. This will involve one 15 minute visit to our lab.

Learning Novel Labels
2 and 4 year olds

How do children use social and verbal cues when learning a novel word from their communicative partners? We will show children some unfamiliar toys and teach them novel (nonsense) labels for these toys. This study will involve one 20 minute visit to our lab.

Science Misconceptions
5 year olds

How do children learn physics concepts from different types of books? Your child will be read a book and then asked some questions using pictures and props. This study will involve one 30 minute visit to our lab.

Making Sense of Stories
7 year olds

How do children use the language in stories to make sense of what is happening? We will show your child some sentences or stories on a screen, and we'll track their eye movements as the stories play. We will also play some computer games. This will involve one visit to the lab for about 1 hour.

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