

2020

The final update from the Language Lab

Dear Families,



It has been an incredible year of challenges for everyone. This time last year no one could have foreseen what would happen, and luckily for Canberra residents, the virus has mostly been a distant threat. Having said that, in the beginning the ANU and the lab closed down for many months, which caused a mild blip in finishing testing for the Canberra Longitudinal Child Language Project. However, after waiting out the first (initially scary) period, we adjusted our testing protocols, which included some online testing via Zoom, and we thankfully managed to finish. And thus, as of October, we have bid farewell to all of our 5-year-old participants! A big THANK YOU to everyone who has been involved in our research endeavours. We are in the process of organising a morning tea for CLCL families in January, so keep your eye on your inbox for an invitation. In the meantime, here's a summary of some of our findings from this year...

The Canberra Longitudinal Child Language Project

The Canberra Longitudinal Child Language (CLCL) Project tracked the typically developing language of a cohort of approximately 120 Canberran children, from 9 months old through to 5 years of age - when they were ready for school. For details, see the CLCL tab on our website: <https://anulanguagelab.wordpress.com/clcl-project/>

As of October this year the cohort had completed all 12 testing sessions; up until 5 year of age (60 months old).

The big news from 2020 is that we have completed testing! This means that all children left in the cohort have had their final session and graduated! We are ever so grateful for the time that all of our families have put into this project. Congratulations on an amazing effort!

Here are some of the things we have discovered from the analyses that we have conducted thus far:

1. **Conversation directly influences vocabulary growth.**

The main function of language is to communicate, which we do in social groups (something that has taken on new meaning during the pandemic!). It is assumed that children do a lot of their language learning through interaction, but that's not always easy to test. In a large analysis of the CLCL dataset, we investigated the two-way relationship between the number of conversational turns children take with others (i.e., how often a conversation switches between speakers, as measured by the daylong recordings), and the children's vocabulary development. Our research question was: does having more conversational interaction with others increase children's vocabulary, and does an increase in vocabulary increase the children's conversational interaction, across the first two years of life (9 – 24 months). The answer was a resounding YES! Thus, practising the to-and-fro of conversation helps children master their language, presumably because it is easier to learn words when they are used in meaningful interaction. The paper will appear in the journal *Child Development*.

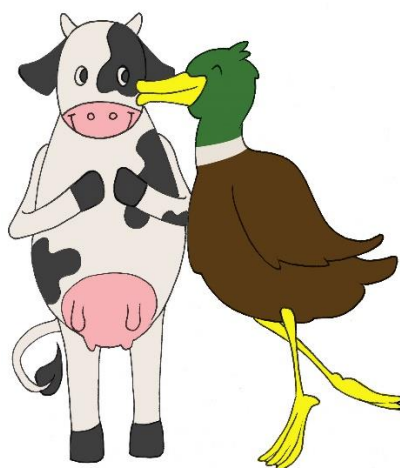
2. **Children's vocabulary has 'adult' structure very early.**

When the children were 30 months old they completed a 'Looking While Listening' task, in which they saw two pictures (e.g., a ball and a cake) and they heard a sentence that directed their attention to one of the objects (e.g., *Find the ball!*) while their eye-movements were recorded. In adults, words that sound similar to many other words are

recognized more slowly than words that sound similar to fewer words. For instance, in English there are many words that begin with 'b', and this means that it takes longer to access a word like *ball* because it has many competitors (and when we say *longer* we're just talking milliseconds). This shows that our 'mental lexicon' has structure – we store words according to how they sound (among other principles). We found the same effect in our sample of 30 month olds; words that start with 'b', for example, are recognized less quickly than words that start with "l". This difference was larger for 30 month olds with large vocabularies than it was for 30 month olds with smaller vocabulary, presumably because having a larger vocabulary means a child has more 'b' words to search through.

3. **The emergence of grammar.**

One of the children's favourite tasks at the Lab is the SNAP card game, where they take turns with Amanda to describe the pictures (especially because they always win!). What the kids didn't realise was that we were secretly looking for their knowledge of a complex grammatical structure – the passive.



When we describe an action like the one in the picture, we can say “*The duck is kissing the cow*” or “*The cow is being kissed by the duck*”. The second sentence is a passive structure, which is much harder for kids (and even adults) to understand and produce. Earlier research has shown that after they hear a passive, children often use a passive to describe their own picture, showing that they know something about the structure. We were interested in how this knowledge develops over time, and whether it is tied to children’s individual knowledge of verbs. Thus, sometimes Amanda and the kids used the same verb in their descriptions, and sometimes they were different, as in the table below.

	Amanda’s sentence	Child’s sentence
Same verb	The cow was kissed by the duck	The chicken was kissed by the sheep
Different verb	The cow was kissed by the duck	The dog was chased by the cat

The children did the task four times between 36 – 54 months, and we found some very interesting results. In particular, we found evidence that about 40% of the children had knowledge of the passive at 36 months, which is very early! Interestingly, only once the children got older did they begin to link individual verbs to the structure (by saying more passives when they used the same verb as Amanda), suggesting that the relationship between verbs and grammar changes across early childhood.

Shanthi is researching this to discover how and when children learn complex

grammatical structures, and has been analysing some of the CLCL data. She worked as a Research Assistant in the Lab for two years before moving to the Max Planck Institute for Psycholinguistics in the Netherlands to start her PhD with Evan. When coronavirus hit, she got to return to Australia and work remotely back with the wonderful team at ANU.

Noëlie Creaghe’s thesis passed!

Noëlie submitted her PhD thesis last November, and early in the new year received the news that it passed (with flying colours)! Her thesis analysed data that was collected for Sara Quinn’s thesis, combining a novel combination of methods to investigate how interaction between 2-year-old infants and their caregivers is influenced by symbolic play (i.e., pretend play, as in objects are used for novel purposes, like pretending a block is a piece of cake). Following on from Sara’s work, Noëlie found that, when there are pretend elements in play, infants and their caregivers engage in many different types of communicative behaviours that aid language development (e.g., more intensive conversation, which is more focused on specific topics). She also pioneered the use of a computer program that analyses conversation. Noëlie is currently writing up her research for publication, in addition to working as a researcher in a fancy AI firm. You can access the first paper from her thesis here: <https://psyarxiv.com/eg8yz/>.

Emmy Award!

One final piece of news is that the documentary series that Evan worked on, *Old People’s Home for 4 year olds* (ABC/Endemol) just won an International Emmy Award! The

series is still available on ABC iView, so check it out if you haven't yet seen it (<https://iview.abc.net.au/show/old-people-s-home-for-4-year-olds>).

Publications

The first paper from the primary school longitudinal research project *Individual Differences in Language Development* (IDLD) was recently published in the *Journal of Experimental Child Psychology*. The paper, titled 'Measuring children's auditory statistical learning via serial recall', describes a task many of our research participants will remember fondly, the 'Rusty the Robot' game! In the IDLD project it was a little different in that it was delivered as an 'Alien Spaceship' game. Children had to listen to a long sequence of alien code (rather than robot language) coming through an alien spaceship radio, and then try to recreate some of the unique syllable patterns themselves. The development of this task was really exciting, as we contrasted two different methods for measuring learning in children, specifically for measuring implicit learning, where children's brains may recognise familiar patterns or identify probabilities without their conscious awareness. In one method, children listened to two contrasting syllable sequences and then we asked them explicitly which pattern they remember hearing within the alien code. In the second method, children listened to the syllable sequences and then we simply asked them to verbally repeat back the syllables into a recorder. We found that they had significantly greater success at accurately repeating familiar sequences of syllables, than at consciously identifying which sequence was familiar.

If you are interested in more details, the paper can be found at https://pure.mpg.de/rest/items/item_3249915_2/component/file_3249916/contentt

This month we say a very sad goodbye to Katherine, who has been coordinating our IDLD project. Over the past four and a half years, Katherine coordinated the collection of reams of longitudinal data from primary school students across Canberra, to investigate various factors that may affect individual language development. We look forward to seeing more published IDLD papers in the future, and we wish Katherine all the best with her next endeavour.

We have been busy working away at a range of papers over the last year. If you want a copy of the full-length version of any of our publications, email Amanda for a copy (amanda.piper@anu.edu.au), or download them directly from Evan's publications page (<https://www.mpi.nl/people/kidd-evan/publications>). We have several other papers in preparation or in submission, so watch this space for more to come!

Meet the Language Lab Team



Dr Evan Kidd

Evan is an Associate Professor in the Research School of Psychology at The Australian National University, and is the Language Lab's founder. He has been studying child language acquisition for 23 years in a number of different countries and cultural contexts, from "big city" contexts like Canberra to the wilds of Papua New Guinea.



Amanda Piper

Amanda is the Research Officer currently managing the Canberra Longitudinal Child Language Project. She completed her Bachelor degree in Applied Psychology at The University of Canberra. She went on to clinical studies, before having her two children, now aged 9 and 12 years-old. She was previously teaching at the ANU Research School of Psychology before moving to the language lab at the start of 2018.



Seamus Donnelly

Seamus is instrumental in the analysis and interpretation of our various growing data sets, especially the CLCL Project. He has been with the lab since the beginning of 2016, and has presented the findings of our research at several international conferences. Seamus' PhD research, completed at the Graduate Centre at the City University of New York, investigated the effects of bilingualism on cognition.



Katherine Revius

Katherine is a Research Officer who joined the Lab in mid-2016. She coordinated and tested for the IDLD longitudinal project and is a valuable contributor in the lab overall. Previously, she has worked in the Child Language Lab at Macquarie University. Katherine has a degree in Linguistics from The University of NSW, and is a mum of three.



Shanthi Kumarage

Shanthi began working with the Lab as a Research Assistant, after having previously assisted on several studies and completing a student project with us. She has recently completed testing for the IDLD project alongside Katherine, as well as working with data for the CLCL Project. Shanthi is currently working on her PhD, on complex grammatical structures.



Noelle Creaghe

Noelle has completed her PhD research at the Lab which investigated the effect of different types of play on language acquisition. She completed her degree in Psychology at Harvard University and is mum to a 5-year-old!

Thank-you from the Language Lab team for your interest and involvement in our research.

More information about the Language Lab's research projects and activities is on our website:

<https://anulanguagelab.wordpress.com/>

Also on Facebook:

www.facebook.com/LangLabANU