

2017

An update from the Language Lab

Dear Families,

Another year is almost done and we have lots to report! Here is our annual summary of what we have been up to and the things we have learnt from our research this year.

2017 has seen exciting progress in both of the Language Lab's ongoing major projects. The results are slowly but surely coming in, with the team making several successful presentations at conferences both locally and internationally. Our PhD and Honours students have also made great progress.

Thank you, as always, to all the of children and families who are involved with the Lab and our projects. Many of you will recognise much that is described below. No doubt 2018 will bring some new studies and the opportunity for us to welcome new faces into the lab for participation! In the meantime, we hope that you enjoy reading the following summaries of our work.



The Canberra Longitudinal Child Language Project

The Canberra Longitudinal Child Language (CLCL) Project is tracking the typically developing language of a cohort of approx 120 Canberran children, from 9 months old through to 5 years of age - when they will be ready for school.

(For details, see the CLCL tab on our website: <https://anulanguagelab.wordpress.com/clcl-project/>)

It has been a fun year for the CLCL Project, with our youngest participant having turned two and the eldest of the cohort now three years old! All of the children

constantly surprise (and entertain!) us – it is great fun to now be able to chat with them in full sentences, and it is a privilege to be able to watch them all growing up.

As part of the Project, our participants complete both in-lab components, such as eye-tracking tasks, narration and play tasks, as well as take-home components, such as questionnaires and audio recordings, giving us a great wealth of data about their linguistic environment and many aspects of their language development.

As of October this year, the entire cohort has completed (at least) their first 6 testing sessions, meaning we have a set of data for all participants from 9 through to 24 months of age – a substantial set of information for us to begin working with!!

NOVEMBER 2017



Lauren having fun with a 3-year-old member of the CLCL Project cohort.

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

Comparing 9-month EEG results to 15-month old word learning:

At 9 months of age, our CLCL participants completed an electroencephalogram (EEG) ‘speech segmentation’ task, which examined how well infants could identify single words within spoken sentences. To do so, we examined the infants’ brain activity (called an ‘event-related potential’, ERP) via EEG (See our 2016 Newsletter for the details of this task: https://anulanguagelab.files.wordpress.com/2016/09/november_2016.pdf).

At 15 months of age, the children completed a ‘cross-situational word learning’ task on our eye-tracker, which examined how well they could learn names for objects simply by observing the correspondence between words and pictures (details also in our 2016 Newsletter).

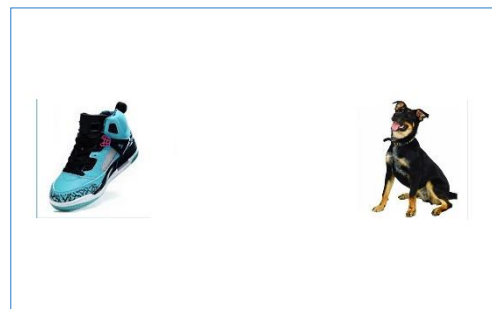
Interestingly, children’s ability to identify words in spoken sentences at 9-months was related to their ability to learn new words at 15-months. It seems that if children were better at discerning words within sentences as an infant they also tended to better pick up which names matched the objects in the task six months later.

This shows that, even at 9-months, we have been able to determine how differences in early language are related to later language, even before children are typically speaking.

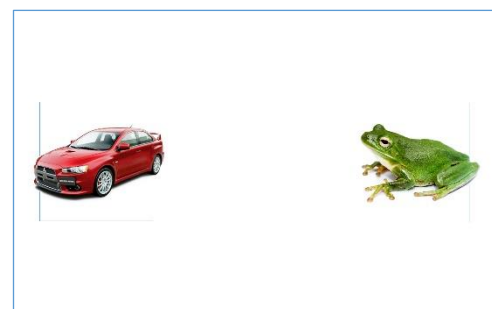
This research was presented at the International Association for the Study of Child Language in Lyon, France, this July.

Comparing word processing speeds across time:

During their 18-, 21-, and 24-month visits the CLCL children have completed a ‘Looking-while-listening’ eye tracking task. This task examines the speed with which the children can ‘find the picture’ out of two images presented on the screen when they hear a directive, such as:



“Find me the shoe!”



“Where is the frog?!”

From their reaction times on this task we can infer the speed with which the children are processing spoken language, relative to others in the cohort.

We compared these reaction times across the 18, 21 and 24 month tasks and, as we would expect, as the children got older their reactions times got consistently quicker across the cohort. No doubt it will be of no surprise to any of you that the kids are becoming speedy at language processing over this time!

This trend is evident when we look at the group as a whole, and also when we look at individual children. That is, those children who recognised words faster compared to the rest of the cohort at 18 months also continued to do so at 21 and 24 months of age.

This finding was presented at this year’s Developing Lexicon Workshop, in Sydney.

Comparing word processing speeds to vocabulary growth and early grammatical ability:

We also compared these processing speeds to the growth in the children's vocabulary and the development of their early grammatical ability. Children's reaction times on the Looking-while-listening task were compared to their parents' reports of the children's vocabulary size, as well as the average length of the sentences or 'utterances' the children were producing at each age point (with the ability to produce longer utterances indicating more developed early grammatical ability).

Across the cohort, we found that those children who had quicker reaction times on the Looking-while-listening task at 18 months had a greater increase from 18 to 21 months in both the number of words they were saying as well as the number of words they were stringing together into utterances. Those children

who recognised words more quickly at 18 months showed greater the growth in their vocabulary and grammatical ability between 18 and 21 months.

While this may seem fairly obvious to parents who see their children's growth from such a privileged viewpoint, it is very exciting to begin to see the data from our cohort of children truly reflecting these general ideas that people hold (and which our theories predict)!

This compelling finding was presented at the 'Many Paths to the Acquisition of Language' Workshop in Nijmegen, Netherlands, this October.

The next wave of CLCL testing sessions are scheduled for the children's 42nd month of age (3.5 years), which will be underway in February 2018.

Once again, we send a huge thank you to all the wonderful families in the CLCL cohort for their continued commitment to this Project.

Individual Differences in Language Development (IDLD) Project

Our ARC Discovery Project, entitled "Discovering sources of individual differences in child language acquisition" (IDLD Project for short), has continued with great success around several Canberra primary schools.

The IDLD Project follows over 120 typically-developing children, tracking their progress of their language, literacy, and "statistical learning" abilities through two years of their early primary schooling.

The project comprises four testing phases, each six months apart. All schools have completed the first two phases and the team are now well underway conducting Phase 3.

Phase 3 of the IDLD Project begins to incorporate some specific literacy measures for the first time.

Along with repeating their old favourites (see 2016 Newsletter for details), the children are now completing two new tasks:



Shanthi and Katherine celebrating book week with a local primary school

- the *Wide Range Achievement Test* (WRAT, 4th edition), which measures how well they can read aloud a set of printed words of increasing difficulty, and
- the *Neale Analysis of Reading Ability* (NEALE, 3rd edition), which consists of a set of graded narrative passages to measure their rate, accuracy, and comprehension during out-loud reading.

It has been a lot of fun watching our fast-growing Year 1 students read stories to us with great enthusiasm!

We love seeing the children's enjoyment in completing our tasks – in fact several students have asked us where they can get hold of our games for themselves to play at home! For now, they'll just have to wait until they see us again in six months' time!

Phase 4 of the project is lined up to begin in March 2018.

Many thanks again go out to our participating schools and students, all of whom have been so friendly, enthusiastic and welcoming!

You can learn more about the details of the IDLD Project and follow its progress here:

<https://anulanguagelab.wordpress.com/idld-project/>

Other Studies

Noelie Craghe has made great progress with her PhD research, investigating the effect of different types of play on language acquisition. Her work looks into the dynamics of language interaction between a parent and their child. She continues to analyse Dr Sara Quinn's longitudinal data of 54 children at 18 and 24 months of age, to help elucidate what facilitates (or hinders) early language acquisition.

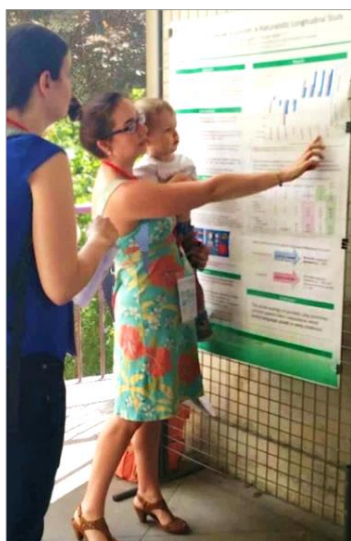


Functional toy set



Symbolic toy set

Using two sets of toys (pictured), the study was designed to elicit different types of play between a child and their parent. For 10 minutes participants were given functional toys (e.g. a hammer and pegs or a puzzle) and for 10 minutes they were given symbolic or pretend play toys (e.g. a tea set or teddy bear). The type of language they used was then compared between the two conditions.



Noelie presenting her findings in Lyon, with son, Marius, helping!

Noelie's initial findings support the Language Lab's previous reports that symbolic or pretend play increases the quality of linguistic interaction between a parent and their child, predicting better language development six months later. Parents tend to ask more questions and give fewer orders when pretending, and this seems to be more helpful for the child's language development.

As an extension on this, Noelie has now begun to look into who initiates topics of conversations within the different play settings. Preliminary results suggest that it is the child who is more likely to do so within a pretend play setting, which could further explain why pretend play is such a fertile environment for language development.

Noelie presented her work at the International Association for the Study of Child Language Conference in France this year, where her findings were well received. She is looking forward to analysing her data further over the coming months.

“Infant sensitivity to variation in speech sounds” EEG study: This study was conducted in collaboration with our colleagues Paola Escudero and Alba Tuninetti at the MARCS Institute’s BabyLab (Western Sydney University), and investigated how 12-month-old infants process fundamental speech sounds when compared to adults.



A 12-month-old participant ready for her EEG.

During the experiment infants heard a single repeated speech sound – an isolated vowel – through speakers. This repeated vowel was interspersed with a different ‘deviant’ speech sound, e.g., a different vowel sound, or the same vowel said by a different speaker/voice. The aim was to investigate the contexts in which infants recognise these differences when compared to adults. Both the infants’ and adults’ neural activity was measured using EEG.

The results showed that infants and adults process these sounds very differently. While adults are most sensitive to those sounds which are the most different from the repeated vowel (i.e., the sounds that correspond to an accent or gender change), infants tend to be sensitive to those sounds which signal a change in speaker. This is very interesting because it suggests that there is a change in the way humans process changes in speech sounds from infancy to adulthood.

It may be that infants are most sensitive to speaker changes because they are more likely to pick out a certain speaker’s voice (e.g., their mum or dad) from others. This has been shown in previous research – newborns are most sensitive to their own mother’s voice, even immediately after birth – and these results show that this sensitivity to a change in speaker can last until at least an infant’s first birthday.

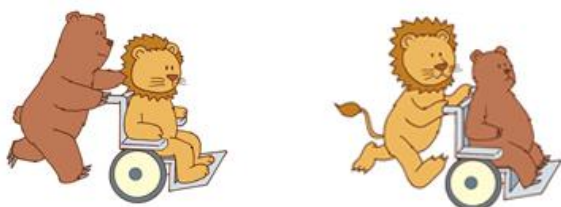
Honours Theses

Our newest lab member **Shanthi Kumarage** completed her Honours thesis in June this year. Her Honours study examined factors that might influence children’s learning of grammar, in particular the passive construction of sentences, e.g. “The turtle was fed by the rabbit” (as opposed to the active construction “The rabbit fed the turtle”).

One factor that researchers think might help children to learn grammar is their ability to find patterns in input. To measure this, Shanthi used a task that presented audio of a series of syllables to children and tested how well they noticed the recurring ‘words’ within these syllables. Shanthi then assessed the children’s comprehension of passive sentences by means of a picture-pointing task, where children were shown a set of complementary pictures on a screen (e.g. image below) and asked to indicate, for example, “Which bear is being pushed by the lion?”



Shanthi receiving her Honours (First Class) degree



“Which bear is being pushed by the lion?”

In her sample of 5 - 6 year old children, Shanthi found that those who were better at detecting the patterns in the auditory input also had a better understanding of sentences that used a passive construction. This suggests that our ability to detect regularities at a young age could play a role in our ability to learn the pattern of grammatical structures in the language we hear.

Meet the Language Lab Team



Dr Evan Kidd

Evan has been studying child language acquisition for 20 years across a range of different countries and cultural contexts – from “big city” contexts like Canberra to the wilds of Papua New Guinea.

Evan founded the Language Lab in 2012. Evan’s most recent challenge is working between both Canberra and the Netherlands. He holds a position as a Senior Investigator at the Max Planck Institute for Psycholinguistics in Nijmegen, while also continuing to direct the research here at the ANU Language Lab. This means he spends a lot of time on planes!



Lauren Morrison

Lauren has been working as a Research Assistant in the ANU Language Lab on a variety of child language development studies since 2013. She is the lab co-ordinator and is the Research Officer currently managing the Canberra Longitudinal Child Language Project.

She completed her degree in Psychological Science at The University of Newcastle.



Dr 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, and is currently co-ordinating and testing for the IDLD longitudinal project. 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 two (with one on the way!).



Shanthi Kumarage

Shanthi began working with the Lab as a Research Assistant this year, after having previously assisted on several studies and completing a student project with us. She is conducting testing for the IDLD project alongside Katherine, as well as working with data for the CLCL Project.

Shanthi also completed her Honours thesis at The ANU this year, which examined factors influencing children’s learning of grammar.



Noelle Creaghe

Noelle is currently undertaking her PhD research within the Lab, investigating the effect of different types of play on language acquisition (supervised by Dr Kidd).

She completed her degree in Psychology at Harvard University and is Mum to a 1-year-old.



Dr Tara Spokes

Although having moved to other employment in February 2017, Tara continues to be involved with the Lab by contributing to analyses for the EEG elements of our research.

Her PhD research, completed through Griffith University, investigated changes in brain activity associated with aging using EEG.

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

You can find more information about the Language Lab's research projects and activities on our website: <https://anulanguagelab.wordpress.com/> and on Facebook: www.facebook.com/LangLabANU