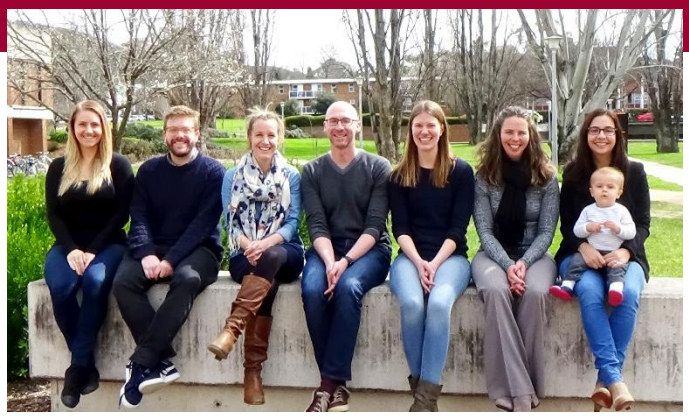
2016

An update from the Language Lab



Dear Families,

It has been a big year for the Language Lab – our team has grown, our projects have progressesed, and the families of a lot of our participants have grown!
Thank you once again to everyone who has been involved in our research endeavours this year for your interest and enthusiasm for our research. Our contact database is now around 340 strong – that's a lot of wonderful Canberran families interested in language acquisition research!
Here is a summary for you of what has happened in the Lab throughout 2016, and an update on the findings of our research this year.

The Canberra Longitudinal Child Language Project

We finalsed the cohort for the CLCL Project, seeing our last participant for their 9-month old session in July. The cohort now consists of over 120 Canberran families!

The CLCL Project tracks the childrens' typically developing language from 9 months through to 5 years of age, when they will be ready for school. (See the CLCL tab on our website for details about what the Project involves! https://anulanguagelab.wordpress.com/clcl-project/)

Our cohort has grown so much! In October our youngest participant had her 1st Brithday, about half of the children are now 18 months old, and the eldest children in the group have been coming in for their 24-month sessions.

It is such a joy watching their personalities develop alongside their language! The next set of testing sessions, scheduled at 30-months of age, are lined up to begin at the end of January 2017.

This means we are reaching the point where our data sets are becoming robust enough to begin some preliminary analyses. Longitudinal studies take some time to gain results, as we need to wait until enough children have completed the tasks at older age points before we can run meaningful comparisons.

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This will all come along more quickly next year as more children reach 2 years of age, so there are exciting times ahead!

Here is what some of the data we have been able to analyse seems to be telling us so far.

9-month-old EEG:

With a full set of data from our cohort at 9 months of age we have been able to begin some analysis of their responses on our EEG (electroencephalography) task.

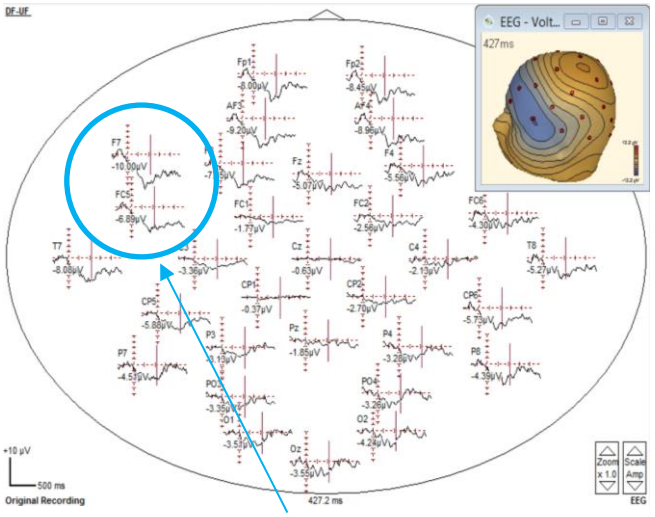
At the beginning of the CLCL journey, our cohort completed a task where they listened to running speech stimuli while their brain activity was recorded via a (very little!) EEG cap.

The children heard a series of sentences, each followed by a single test word. These test words fell into two conditions: half of the time the word had been in the preceding sentence (familiar), and the other half the word was previously unheard (unfamiliar).

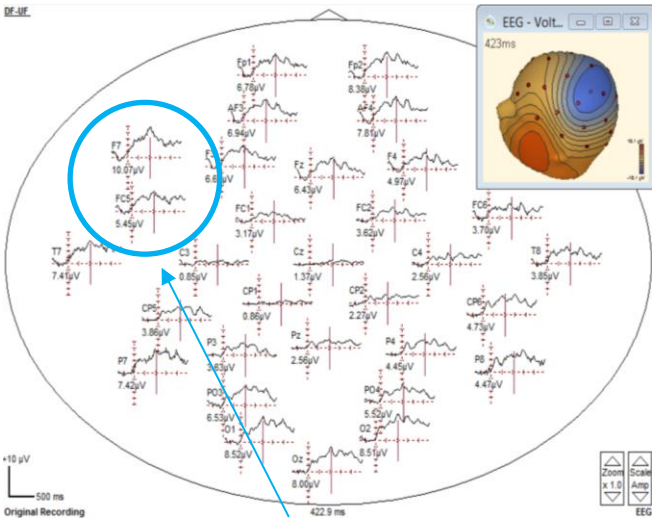
We were interested in whether there was a difference in how the infants were processing these two types of words.

Those who have conducted similar studies in the past had only identified two separate groups when comparing infants' brain activity between the two conditions: those with a negative response curve and those with a positive shaped curve.

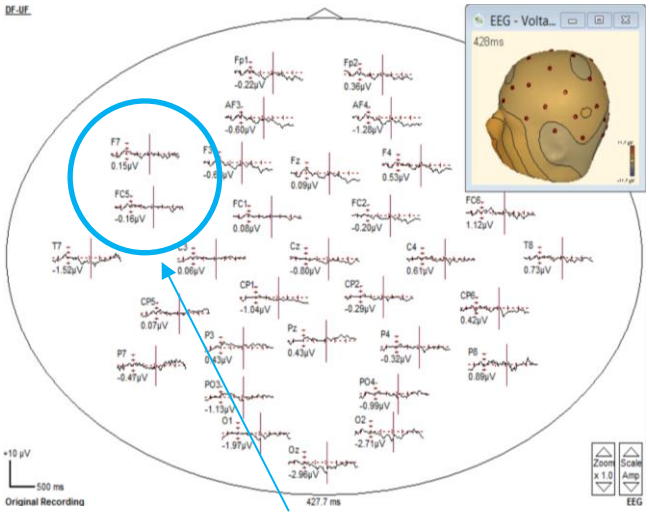
We were able to discern that there is much more of a continuum in the way that infants process familiar compared to unfamiliar words. Our sample's responses extended from those with a strong positivity to a strong negativity, and ranging through some who do not show much difference in between (we have called these 'neutral responders'; see images, right).



Negative response curves



Positive response curves



A neutral response curve

* Illustrations of the difference in electrical activity recorded across the children's scalps when they were processing familiar compared to unfamiliar words.

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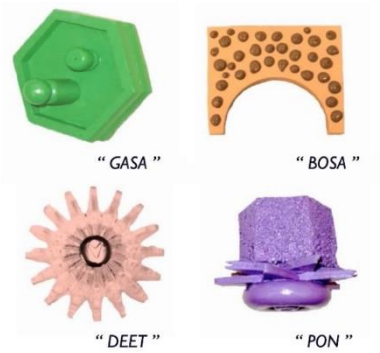
Looking forward, infants who showed an ERP difference curve that is more negative seem to be picking up language quicker (when looking at their later vocabulary production scores), while those who show more positive curves are catching up sometime thereafter. The neutral responders seem to be somewhere in the middle.

These results are interesting because they suggest that we may be able to use subtle measures like EEG recordings to identify children's developmental language levels even before many are speaking.

We will be submitting our first paper for the Project for publication to report these findings – keep an eye out for it on our website if you would like a more detailed description of these results.

15-month-old comparisons:

The eye-tracking task that the CLCL children complete at 15 months of age measures 'cross-situational learning' – that is, their ability to learn things via exposure to them across different contexts. In this eye-tracking task, we see how well the children learn to match eight new (nonsense) words with eight distinct new objects they see on our screen (such as those pictured here).



We have taken data from a subset of participants who have completed this learning task so far, and run a comparison against their responses to the EEG task at 9 months of age. From this subset, it appears that the number of these new words the children learned at 15 months was in fact predicted by their earlier EEG data: children who had more negative ERP response curves at 9 months old seem to be those who are learning more of the words on the cross-situational learning task.

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We can't wait to see our cohort's linguistic abilities continue to grow in leaps and bounds next year! We once again we send a *huge* thank you to everyone in the CLCL cohort for their continued commitment to this Project.

Individual Differences in Language Development (IDLD) Project

A new longitudinal project has begun at the Language Lab!: an ARC Discovery Project, entitled "*Discovering sources of individual differences in child language acquisition,*" or the 'Individual Differences in Language Development' (IDLD) Project for short.

The IDLD Project follows 80+ typically-developing children through the first two years of primary school. Children will be assessed on several cognitive measures that are related to language and literacy, and we will then

determine how well these measures predict children's spoken language and literacy development across the following 18 months. We plan to measure their growth at 6-monthly points over a total of four testing phases.
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Testing Phase One is off and running, with lab members Katherine Revius, Shanthi Kumarage and Sara Quinn rolling out this initial testing in our first Canberra primary schools.

Participating Kindergarteners have been completing fun activities and games, including a novel version of the card game 'Snap' (pictured above), which tests their grammar production, and an 'alien detective' computer game, which measures how well they can implicitly detect patterns. We have been collecting great baseline data.

We are having a lot of fun meeting all our new participants, who have all been wonderful helpers! A big thank you goes out to all the participating schools for their generous hospitality and support.

You can learn more about the details of the IDLD Project and follow its progress here: https://anulanguagelab.wordpress.com/idld-project/

Other Projects

Dr Tara Spokes has been running an infant EEG study in conjunction with the **MARCS Institute's BabyLab**, who are based at Western Sydney University. This study is investigating how infants around 12 months of age are processing fundamental speech sounds compared to adults.

The infant hears a single repeated speech sound - one of four different versions of an isolated vowel - and this sound is interspersed with a 'deviant' speech sound, e.g. the same vowel but a different speaker/voice or a different vowel sound.

We are interested in whether the infants are processing these deviations in speech sounds in a similar way to adults (who are experienced language users), or if they process it differently. That is, even in the early stages of language, do infants recognise that these sounds have something in common, or are they processing them as wholly different sounds?

Testing for this study will wrap up in January next year, when we hope to have tested around 50 little ones. We'll keep you posted with the results!

It has been an eventful year for **Dr Sara Quinn**, who's well deserved PhD was awarded in July. Her longitudinal study of 54 children found that symbolic, or 'pretend' play (e.g. a pretend tea party), provides a particularly rich language environment where children display more complex language and conversation than functional play (e.g. making a puzzle).

The results of her research highlight the importance of the symbolic play context in promoting qualities of parent-infant interactions, which then predict language growth in early childhood. Since July, these results have sparked media interest, which has provided a nice platform to promote pretend play as a context for learning.

While writing up these results for publication, Sara has also had the opportunity to guest lecture at the ANU. She looks forward to seeing what opportunities 2017 provides, and offers her sincere thanks to all the parents and infants who participated in her study!

Noelie Creaghe joined the Lab this year to pursue her PhD. She is looking at the effect of different types of play on language acquisition, following on from Dr Quinn's findings that aspects of pretend play predicted language acquisition six months later.

Noelie is hoping to replicate these findings when examining the children's performance at 24 months of age. She will also continue to research the different patterns of language use that are present in the symbolic and functional play contexts to develop a better understanding of how this influences language acquisition.
It is a pleasure to have her as part of the Lab team and we look forward to learning from her findings!

Honours Theses

This year we had three Honours students conduct their research theses in conjunction with the Lab. **Elaine Tsoi** conducted her thesis on Mandarin-English bilingual children's acquisition of grammar, with children aged 4-10 years old. **Ross Sutherland** investigated the relationship between home language environment and early (18-months old) vocabulary acquisition, and **Adam Usher** investigated the relationship between statistical learning and language processing in adults.
We congratulate them all on their fine efforts and wish them well in their future endeavours.

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 19 years across a range of different countries and cultural contexts – from "big city" contexts like Canberra to the wilds of Papua New Guinea. He also lectures in Developmental Psychology.

Lauren Morrison
Lauren has been working as a Research Assistant to Dr Kidd on a variety of child language development studies since 2013, 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 Tara Spokes

Tara runs the EEG elements of our studies in the Lab. She has continued working primarily on the testing and analysis of the EEG component of the CLCL Project.
Her PhD research, completed through Griffith University, investigated changes in brain activity associated with aging using EEG. She is a mum of two, and has also lectured and conveined several undergratuate courses in the School of Psychology this year.

Dr Sara Quinn

Sara was awarded her PhD in clinical Psychology from ANU this year for her research into how pretend play influences language acquisition, which was supervised by Dr Kidd.
She continues working part time as a Research Assistant in the Lab alongside her practice as a Clinical Psychologist, and is a mum of two.

Dr Seamus Donnelly

We welcomed Seamus to our team at the start of this year. He is intrumental in analysing and interpreting our various growing data sets.
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 Assistant who joined the Lab in mid-2016, and is currently coordinating the IDLD longitudinal project. Previously, she has worked in the Child Language Lab at Macquarie University.
She is a mum of two little ones, and has a degree in Linguistics from The University of NSW.

Noelie Creaghe

Noelie is currently undertaking her PhD research at the Lab (supervised by Dr Kidd and liasing with Dr Quinn), investigating the effect of different types of play on language acquisition.
She is Mum to a 13-month old, who occasionally gets to helps out with our testing!
She completed her degree in Psychology at Harvard University.

Shanthi Kumarage

Shanthi is currently conducting testing for the IDLD project alongside Katherine. She has assisted previously on several studies in the Lab and completed a student project in conjunction with us last year. She is currently completing her Honours year for her Bachelor of Psychology at The ANU.

Many thanks once again for your involvement with the Language Lab. We look forward to hopefully meeting many more of you next year. Have a safe and happy holiday season!

You can keep up to date with the Language Lab's regular activities by liking our Facebook page!: *www.facebook.com/LangLabANU*