Plymouth Babylab Newsletter 2015/16

Hello! Welcome to the Plymouth Babylab Annual Newsletter. First of all, we would like to say a massive thank you to all the parents who have brought their children to visit us at the Babylab this year. Without your help we would not be able to do this so we appreciate all the support you have given us throughout the year. We've had some very exciting results this year and we hope you enjoy reading about them in this newsletter.

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NEWS

The Babylab has been very busy this year with many different studies being carried out with 5-month-olds to 6-year-olds. Over 650 families have visited us since we started in September! This is an amazing number, thank you for your support.

This year we had 11 final year project students working in the Babylab, many of whom you may have met. The findings from their studies have also been included in the newsletter. All the studies are arranged in age order so it's easy for you to find the studies your child took part in this year and what we found.

The project collecting information from bilingual families has reached an end. Thanks to the support from families living in the UK we have collected the data from over 400 families with 2-year-olds. The data are under scrutiny to identify the factors of vocabulary delay in children who are exposed to two or more languages at home.

Do you have any children who may not be on our database? We would love to have them be a part of the Babylab too! We have studies for children that look at language, memory, social and emotional development. You can let us know by calling 01752 584865 or emailing us at plymouthbabylab@googlemail.com.

Over the past year you may have met Chloe and Charlotte during your visit to see us; we will be leaving this month to continue with our undergraduate degree. We will be replaced by four new placement students in September; Nicole, Danni, Abi & Sarah.

GEAR (5 months)

Babies don't know whether around us, only one language is spoken, or more than one. They need to find out very quickly in order to adapt their learning on each language independently. Some people have proposed that babies can sort out languages according to their "rhythmic class", that is, the kind of unit that gives the tempo. In English and German, it is the stress unit (strong or accented syllables), whereas in French and Spanish, it is the syllable itself. We have challenged this hypothesis over the past years by showing that infants can actually distinguish between languages that belong to the same rhythmic class, which contradicts the rhythmic class hypothesis. The GEAR experiment is the last one in this series: we presented 5-month-olds with sentences in German and sentences in Arabic, as these languages belong to the same rhythmic class. We tested 45 infants and results show a good discrimination, which is encouraging for our hypothesis!

Mummy (5 months)

Collaboration with Dr Thierry Nazzi, CNRS-University Paris Descartes

We know that babies start understanding common words by the age of 6 months, but what has always made debate in the field is how much detail they have memorised about these words. For you and me, if someone says "nunny" instead of "mummy", we immediately hear the difference. If babies were showing the same reaction, we would have one additional argument to say that human infants come fully prepared to perceive speech sounds, and therefore language. So here we used the head-turn procedure and presented 5-month-olds with lists of "mummy" correctly pronounced, versus mispronunciations such as "nummy" or "memmy". About sixty infants took part so far, and results show that infants detect both types of mispronunciation, which is an excellent result!

Line Orientation and Dot/Grid (7-8 months)

Our eyes move around and tell us what we see and how we focus our attention to direct the information in our brain. We know that each side of our brain becomes specialised for many things but we do not know whether these abilities stem from ancestral brain 'division of roles'. With our new fancy eye-tracker, we tracked the movements of the eyes of your infant while they were sitting in the front of the big TV monitor. A group of infants watched images of parallel lines (placed like a 'clock' face) in which one odd line was oriented differently. Another group of children looked at images of a black dot on the screen or placed inside a black grid. After having received 50 infants, I was surprised to see how many of them spotted the different line and made one straight movement with their eyes from the starting attention point to the centre of the screen. We still have to learn which half side of the screen the infants spot the odd line (or the dot) faster.

Size Pitch (12 months)

Collaboration with Prof Roy Patterson from Cambridge University and Prof Sue Denham from our School.

Most baby animals are born with the ability to quickly identify other members of their species around them, which is vital for their survival. They can also judge very quickly whether they are facing an adult or another immature conspecific. For example, chimps can determine whether cooing is produced by an adult or a young chimp, using acoustic information about vocal tract length.

As humans, we are notoriously born with poor abilities to deal with the world - we rely on others for many, many years. Does this mean that we develop later on the ability to judge the size of people by their voice? In this experiment, we examined whether 6-month-olds and 12-month-olds would be able to distinguish between an adult voice and a child voice, using vocal tract length information. Babies were presented with videos of a blond (or a brunette) woman next to a blond (or brunette) child, repeating syllables ("boo" and "bu"). These syllables were computer-generated to either match the vocal tract of an adult or that of a child.

Over the past 3 years, we failed to show any evidence that babies could match the speaker size to the vocal tract information. So this year we embarked on Size Pitch, which is a similar version but this time we manipulated the pitch information, and not the vocal tract length. The pitch is what distinguishes your voice when you sing a high note versus a low note. We were thinking that this dimension should be useful to babies to judge the speaker's size, but we tested 35 12-month-olds with the IPL procedure, and failed to find any effect. Our next step will be to run a control experiment in which we use pitch and vocal tract to see whether infants can distinguish gender between 2 adults. If that works, we will conclude that it takes an extensive experience for human infants to tell conspecifics by their voice, contrary to baby apes!

Bilingual Exposure Questionnaires (12-24 months)

This study aims at designing an assessment tool that would allow parents and researchers to evaluate whether a bilingual child, between 12 to 24 months, learning English plus an additional language would be developing the two languages at a typical rate, or not. Therefore, it is important to have an idea about the amount of exposure that children have for each of their languages to find out if this can predict how many words they know in each of them. This is done through different questionnaires for evaluating the amount of exposure, and we want to identify which one is the best. According to preliminary analyses with 23 children, it is suggested that all the questionnaires contribute equally to the prediction of vocabulary scores. But most of the parents have liked our Plymouth Language Exposure Questionnaire which may drive the decision to use it.

SemCatAssoTaxo15 / 800ms and SemCatAsso18 (13-15/18 months)

Collaboration with Prof Kim Plunkett, University of Oxford

In 2014 we published a study showing that 18-month-old infants, upon hearing lists of words, actually realise that these words share a link (e.g., cat, horse, pig are all animals) and use this information! Since then, we have been interested in two related questions, which would allow us to examine whether infants recognise words with the same kind of mechanisms as adults. This is not a trivial question as there is much debate around the origins of word knowledge.

The first question is how close the words need to be presented together for this link to emerge? In SemCatAsso18, we have lengthened the delay between two words from 400ms to 800ms. In the head turn procedure, infants hear lists of words that share some meaning (cat, dog, pig.. are all animals) versus lists of words that do not have anything in common (cat, door, sock..). We tested 65 infants and found out that 18-month-olds were still interested in the links between the words. This is a good step towards showing that adult and child lexicons are organised similarly.

The second question is how early do these links between words emerge? We are testing a group of 15-month-olds with an easier version of the experiment described above. So far 48 infants took part but results are not decisive at this point.

Allophone G (21 months)

Children need to learn to recognise the words they are hearing in the face of differences in pronunciation. Some of these differences are the results of different accents but others are found in speakers of the same accent. One example of this is glottalisation, this is the term used to describe the two ways people say words such as butter, the 't' sound is frequently altered in these words (listen carefully and you will hear these differences). The work we have already done in the Plymouth Babylab, looking at the 'r' sound in words like farm, has found that children aged 20 months show a preference for one pronunciation of a word over another when they hear both in the same study. We also found that when they hear the words said consistently they have no problem recognising the object the word refers too. We wanted to extend this to look at what children do when they hear glottalised and non-glottalised words. The first student mixed these words up in the same design and we found that children preferred the non-glottalised words (when the 't' sound is very obvious). Of course, we then wanted to see what would happen when they only hear the glottalised words. We have now seen 72 children for this study so we are nearly done and then we can look at the results!

ME-21 (21 months)

Mutual Exclusivity (ME) is one way children are thought to learn new words. When a child hears a word they don't know in the presence of 2 objects, one object they have a name for (e.g. ball) and one object they don't (e.g. garlic crusher), they assume that the new word refers to the new object.

This is a very useful method when learning only one language. However, research has shown that bilingual infants are less likely to use this strategy – as they have to learn every day that an object can have two (or more) names. We are interested in whether children who hear two different accents within the same language (for example Mum is from York and Dad is from Plymouth) also relax their use of this strategy.

In this study, 21-month-old children sat in a high chair facing a screen where pairs of images were presented. A voice said 'look at the ...' and we measured how long the children looked at each picture. Sometimes they knew the word and we expected them to look at the corresponding picture. Sometimes they heard a made up word (e.g. "dax") and in this case we were interested in whether they would look at the picture they knew or the picture of the unknown object. Last year we thought we had finished this series of experiments, but unfortunately when analysing the results it turned out we had not! So this year we completed by testing an additional 20 infants aged 21 months. We will send results for publication soon. Basically we found that infants who hear one or two accents behave the same at 18 months or at 25 months, but at 21 months those who hear two accents stop using the ME principle whereas those who hear one accent still do.

Codafam (21 months)

In this study, 21-month-olds are presented with pairs of pictures on a big TV screen. One of the pictures is named; it might be named correctly, or incorrectly. The incorrect word involves a vowel change or consonant change. The consonant change might be at the start of the word or at the end of the word. For example, for the word 'cat' they might hear 'gat' or 'cad'. We know that 21-month-olds are good at detecting familiar words and are good at noticing when the first consonant and vowel has been changed in a familiar word. Do they notice when the final consonant in the familiar word has been changed? So far, the results show us that 21-month-olds do notice this change too. Thanks to you and your toddlers for taking part, we can also measure how quickly infants detect these changes.

BP3, BP26 and BP27 (22-30 months)

Collaboration with Oxford Babylab, ESRC funded, Prof Kim Plunkett

These three experiments all have the same goal: understanding how little bilinguals recognise words compared to little monolinguals. We know that when an adult bilingual, who speaks for example French and English, hears the word "dog", their brain also activates at the same time its translation in French, "chien". This is an automatic process that cannot be suppressed. We want to know whether the same kind of irrepressible transfer from one language to the other takes place in infancy, when the words are just starting to be learnt. So we present infants with a first word, for example "chien", immediately followed by its translation equivalent, for example "dog" if the baby is a French-English bilingual. Then 2 pictures side by side are presented, depicting a dog and something else, such as a car. We measure how long it takes for the baby to recognise the target image, that is, the dog. Of course we need a comparison point, so either we compare this looking time to the looking time of a monolingual infant for whom "chien" means nothing. BP3, BP26 and BP27 all use slight variations of this principle. BP27 is now finished and we tested around 90 infants, in Plymouth and in Oxford, and found a very interesting counter-intuitive result: infants learning close languages such as English and Dutch behave differently from those learning distant languages, such as English and Cantonese. The latter show a good level of language transfer whereas the former don't. We are still pondering on the meaning of this data. BP26 is nearly finished with more than 80 tested between here and Oxford, and BP3 is halfway to completion with about 35 infants tested. All infants who took part in these studies are either bilingual or monolingual, and they are aged 24 to 28 months.

WinG: Words in Game (33 to 42 months)

Collaboration with Prof Andrea Krott, University of Birmingham

The adaptation of the Word in Game vocabulary test after having seen 400 children aged 19-37 months is nearly completed. After the current data collection we noted that many older children did not reach the maximum peak of word scores, to recognise and name the whole set of cards. We extended the data collection in the Babylab to see a further 30 children between 38 and 42 months. We have seen around 30 children and would like to see many more next year! We do really hope that this test will soon be used by the health care professionals for the purpose to identify children at risk of language difficulties. This study was funded by the Leverhulme Trust and the British Academy.

WingG: Gestures with Words in Game (24 to 36 months)

This work is in collaboration with Australian and Italian researchers using the Words in Game naming test described left. Not surprisingly, Italian children produced a lot more gestures than British and Australian children. Italian children also said and understood more words than British and Australian children; we confirm that living in an enriched gestural environment increases gesture and speech productions.

We also asked whether gestures are anticipatory of the emergence of the words. For example, if children are not sure about the word 'driving' they would spontaneously move the hands to produce a 'driving' gesture pretending to hold a steering wheel of a moving a car. Our findings were surprising; we discovered that children use gestures more often in combination with the spoken word than the gesture alone. It seems that children make use of gestures to reinforce the spoken communication rather than to replace the word when they cannot say the name.

BinG: Words in Game of bilingual children (33 to 37 months)

Some bilingual children know and say fewer words than children of the same age that speak only one language. We believed these bilingual children would use the gestures more often than monolingual children to compensate and enhance effective communication. We still do not know the results but we have seen great variability among the gesture productions but we have not seen wide differences between the two groups.

Thanks to your support, we saw 20 bilingual children so far, and we still need to see many more bilingual children over the next months!

French word-learning (3 and 5 years)

It is well known the younger you start to learn a second language the better! In this study we wanted to see the best way for children to learn a second language using an app. One group of three-year-olds used a French word-learning app on a tablet, another group used interactive toy cubes with the app, and the third group used the app and cubes alongside the help of a parent. A fourth group of 5-year-olds used the app only.

Each group is expected to play the app every other day for 2 months visiting the Babylab twice in this period so we could test the children's French knowledge.

So far in 6 months we have tested 40 children. Those who used the app and cubes with their parent learnt the most French. This shows that the parent helping the child learn the second language is the most important factor. We are going to look into this further next year by adding another group of children who will learn French with a parent without using the app or blocks.

We really appreciate your participation in this study; we understand it is a long study to take part in. Many of the parents have been really pleased their children had the opportunity to learn a second language, especially with this state of the art technology. Not only do the parents get to keep the app and the cubes they also receive the full version of the app, which contains different languages and more play sessions.

Social judgments – 5 year olds (16 tested)

A speaker's accent provides a range of information about an individual's social, regional and ethnic background. As adults, we typically rate those speaking in our local accent more favourably than those speaking with either a regional or foreign accent across a wide range of interpersonal evaluations. In this study, we examine whether children also display this bias for their local accent, investigating whether it impacts upon their trust for individuals.

Children are provided with an iPad that displays a series of two adjacent pictures of females who are all dressed the same and have no distinguishable features (e.g. piercings). In turn, the females then speak a child friendly sentence in either a local Plymouth accent, a regional accent (Scottish or Welsh), or a foreign accent (Russian or Dutch). The children are then asked to select which female they would like to be their babysitter as a measure of their trust.

Our results from previous years have suggested that 3- and 4-year old children do not show any preference for any of the accents presented to them. This finding is in contrast to similar studies in the US that have found that children display a strong preference for their local accent. This year, we have recently started to examine the preferences of 5-year-old children when performing the task to determine slightly older children's accent preferences. We hope to have some exciting findings soon!

Kinect (6-years)

Project for Drs Patric Bach and Marina Wimmer

Only the winning moves: How causality shapes automatic imitation in children

Imitation allows children to acquire new skills by observing others. People often see this as a relatively simple process, in which children copy whatever they see, irrespective of whether it is positive or not, especially if they are impressed with the other person. We are testing whether imitation in children is a smarter process, specifically, whether children can find out what exactly makes someone else's action successful and then copy specifically these important aspects.
In our experiment, children played a game of discus on the on the Xbox Kinect console, which is fun for the children, and allows us to record their whole body movement (without the children having to wear any annoying apparatus). We are interested whether children will change the way they throw the discus after watching somebody else perform it in a different way, and especially if they copy those actions that made the model successful.
This study was funded by a grant from the Leverhulme Trust and the British Academy.

New Mums:

We would like to say a huge thank you to all the new mums that signed up to the Babylab this year! Many of you might have seen us at different baby and toddler groups and even around Drake Circus at Christmas. We are so grateful for your support as the lab could not run without the help of all of you. We look forward to new mums next year!

Caroline's message:

This year, the Babylab is now exactly 10 years old, with our first young participants being now in secondary school or even taking their GCSEs. There is nothing more rewarding for us than to see smiles on toddlers' faces when they return to the Babylab after a few months, as there cannot be any better sign that they enjoyed their session with us. Charlotte and Chloe have done a great job this year as Babylab Research Assistants, and I have no doubt that they will use this experience in the most positive way in their education and career.

On behalf of the Babylab and child development research as a whole, I would like to thank you most sincerely for your repeated trust, and wish you a warm welcome if you just joined us.

Dr Caroline Floccia, Head of the Plymouth Babylab

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