Hello from the Babylab!

Welcome to Plymouth Babylab’s annual newsletter! We would like to say a huge thank you to all the parents and children who have visited us over the last year. We are so grateful for all the support we have received and we hope to see many of you back in the Babylab soon!

We hope you enjoy reading about the different studies and all the ways that you have helped us over the last year.

News

We have had a busy year with a variety of different studies being carried out. Some are now completed, some are ongoing, and we also have some exciting new ones starting. This year, we had 15 final year students working in the Babylab to complete research that was used in their dissertations. Findings from many of the studies can be found below.

We have an ongoing project running where we are trying to gain an understanding of typical language development for bilingual children. If you or anyone you know is raising a child under 2 years old bilingually please sign up at our website: http://www.psy.plymouth.ac.uk/ukbilingualtoddler

If you have any older children or any new additions, we would love for them to come along to the Babylab too! If you would like to sign them up, you can let us know by emailing plymouthbabylab@gmail.com or calling 01752 584865.

Over the past year, you may have met Lauran, Louise and Rebecca; they will be leaving this month to continue with their undergraduate degree. They will be replaced by two new placement students in September, Charlotte and Chloe.
Aspects of Word Learning

**SemCat (15 and 18 months)**

Last year we published in a scientific journal 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.

The first question is how close the words need to be presented together for this link to emerge? In one experiment, we have lengthened the delay between two words from 700 ms to 1s, and we found out that 18-month-olds were then no more interested in the links between the words. We are trying again with a new set of words, and we will also soon start with a delay of 400 ms to see whether it works. This would tell us a lot about the dynamics of the word recognition system in infancy.

The second question is how early do these links between words emerge? We have tested a group of 20 infants at 15 months, but failed to find any evidence of their interest in word-to-word links. We are currently trying again but with a different set of words.

**SemCatColocation (18 and 27 months)**

When hearing a new word (e.g., “modi”) together with animal names, does a child extrapolate that a modi must be an animal like the others?

We have tested 25 18-month olds and about 15 27-month-olds in this new experiment, in which we first present infants with lists of animal names mixed up with a new word, such as “modi”. Then we present them with pictures of a familiar animal (e.g. a cow) with an unfamiliar animal (such as a tapir), and see whether they would look longer at the unfamiliar animal upon hearing “modi”. However, we didn’t find any evidence of word learning so far, possibly because we have created a task too difficult for the children. We will soon start again with a simplified version.

**ILV: Illegal and Legal Vowels (6 and 9 months)**

In standard English, there is an unspoken rule that words must end with a long vowel e.g. bee. Words ending with a short vowel are considered to be unfinished words. At what age do we learn this rule? In this study, children heard lists of nonsense words, ending in either long or short vowels. At 9 months and even at 6 months, with 24 infants in each age group, we found that infants would prefer listening for lists of words ending with a long vowel over lists of words ending with a short vowel, showing that long before they start speaking themselves, they have learned a rule about English sound system. We are just about to submit these findings for publication in a peer-reviewed journal.
ME21 (21 months)

Mutual Exclusivity (ME) is one way children are thought to learn new words. When a child hears a word she doesn’t know in the presence of 2 objects, one she has a name for (e.g. ball) and one she doesn’t (e.g. garlic crusher), she assumes that the new word refers to the new object. This is a very useful method when learning only one language. Research has shown however 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 here 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 the word was a word they knew and then we expected them to look at the corresponding picture. Sometimes they heard a made up word and in this case we were interested in whether they would look at the picture they knew or the picture of the unknown object. This year we conducted the last experiment in this series, and results will be sent out for publication this autumn. 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.

UK-US (16 months)

When we hear speech, it very rarely comes as series of words separated by pauses; all words are produced one after the next in a regular flow. One major problem faced by the child is to determine, in this flow, where is the start of a word and its end. To have an idea of the difficulty of this task, you can listen to a radio in a foreign language and try to spot words.

Twenty years ago an American team first demonstrated with an elegant procedure that American infants from the age of 7.5 months could actually extract words from continuous speech. It is quite simple: the infant is familiarised with two new words, such as "hamlet" and "kingdom". Then she will hear the same two words in sentences ("this hamlet is very far away from the mountain"), plus sentences containing words that have not been presented before. If the child can extract words from continuous speech, then they should listen longer to the sentences containing hamlet and kingdom than to the other sentences. Well, as it happens, a few years ago we attempted to replicate this result here in Plymouth for different purposes at the time, and we failed. We tried again, and again, changing some parameters every time: the age, the words, the timing. The only case where it worked was when we used an exaggerated intonation.

We were about to give up when we met with colleagues from York who had exactly the same problem. So we decided to gather all our null results and publish them; our point will probably be to claim that British English is more difficult to segment for young infants than American English. What we did this year was to test a group of 16-month-olds, because we were 99% sure that at this age, our British toddlers can segment speech in this procedure. However, we have now tested more than 40 infants and the vast majority of them don’t like this study at all: they get bored very quickly, which is understandable at 16 months!
Learning a language is pretty difficult, but 5 month old infants are already doing pretty well! They can recognize “mummy”, and also their name. We have been running two versions of this study, an easy one where the baby will hear a vowel or consonant change to the word ‘mummy’ (i.e. memmy/nummy), and a harder one, where they would hear the word ‘mummy’ with a different stress. We expected that babies should listen longer to the easy version given that the differences are easier to detect.

CodaFam (21 months)

It has regularly been demonstrated that children know lots about the sounds that make up the words they know. Even as young as 12 months children look longer to a picture of a cat when hearing the word ‘cat’ but not when hearing the word ‘gat’. You may remember reading last year about a study we completed here showing that children who hear different accents at home are more flexible with these mispronunciations and still look at a picture of a cat when hearing ‘gat’. This new study looks at the same topic but additionally changes the sound at the end of the word as well. This means we can explore whether the position of the mispronunciation in the word is important for recognising it. We have tested 27 children aged 21 months so far and still have many more to go. We will let you know the results soon...

Allophones (21 months)

Children are great at noticing when someone mispronounces a word they know, if we say ‘gat’ instead of ‘cat’ children do not typically look at a picture of a cat. In a situation where children hear words spoken in different accents they are flexible when words are said wrong, looking at the cat even when they hear ‘gat’. But what about words that all children may hear pronounced differently? For example ‘water’ where the ‘t’ is not always obvious. We took these two possible pronunciations of words and played them to children while showing them two pictures (e.g. one of a glass of water and one of a watch). Interestingly, none of the children recognised the picture when the ‘t’ sound was less obvious in the word recognising only the full pronunciation of words such as ‘water’. This tells us that when hearing words and matching them to pictures children prefer the pronunciations that have all of the sounds clearly pronounced. What we don’t know from this study is whether the children were comparing the words with ‘t’ sounds and those without as they heard both during the study. Would children look at a glass of water when they hear a word without a ‘t’ sound? We have started running a study with only the ‘t’ missing words and have so far seen 19 babies. Hopefully, we will have results from this study to share with you next year!
Discriminating Languages

Languages can be classified in "rhythm families": English, German or Arabic belong to the same, stress-timed, family, and languages such as French, Spanish or Finnish belong to another one (syllable-timed). Researchers have proposed that 5-month-old English infants can distinguish between Dutch and French, but not between Spanish or Finnish, because they have the same "rhythm".

We tested that, playing to children sentences in one language first, to familiarise them with it, and then showed them in alternation this language and another. Our infants could spot a difference between French and Spanish, but not Finnish and Spanish or Finnish and French.

We however noticed that for Finnish and Spanish, some babies noticed a difference, and some did not. So we tried this study with 8 month old infants: they do hear a difference!

We are now trying to explain what clue 8 month olds rely on to spot the difference at this age, and why younger infants do not use this clue that reliably.

We are also running the same study with German and Arabic, two languages belonging to the same family.

GEAR (5 months)

Young infants are particularly interested in the rhythm and melody of speech. In fact, when an infant hears more than one language on a regular basis, rhythm seems to be important for helping tell the different languages apart. For example, five-month-old English-learning babies can distinguish between languages that are rhythmically different from each other, like German and French, but not rhythmically similar languages, like Spanish and Italian.

The current study is investigating whether monolingual English five month old babies are able to distinguish between two languages – German and Arabic – that have similar rhythms to each other and to English, but have quite different vowel and consonant sounds. The results will help us to understand what sound patterns infants pay most attention to when hearing unfamiliar speech.
Eye-Tracking

Line Orientation Project (6-8 months)

Our eyes move around and tell us what we see and how we focus our attention that will then be processed in our brain. We recorded the eye movements of infants while watching images of parallel lines (placed like a ‘clock’ face) in which one odd line was oriented differently. Will infants spot the different line at first movement of their eye and will they have a preference to spot more quickly the odd line placed in the left or in the right side of the screen? We have seen 25 children. We are making progress in looking for a new setting that will help the infants to remain focused on the screen monitor so that we will keep track of their eye movements.

Size Perception

Size (6, 12 and 30 months)

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 that mean that we develop late the ability to judge the size of people by their voice? In this experiment, we examined whether 6-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.

We tested 30 6-month-olds and 25 12-month-olds and found that overall they were unable to match the vocal tract length to the speaker, that is, they would look equally long at the adult and the child upon hearing a syllable produced with a long or a short vocal tract. We have started to test older children, aged 30 months, to determine the age at which we learn to do this task. In parallel, we have also started testing 12-month-olds with a set of syllables contrasted on pitch, which is another acoustic dimension that allows us to identify the size of a speaker.
**Bilingualism**

**Bilingual Priming (27 months)**

The big question is how do bilingual children integrate or separate two languages? Do they learn words in different ways from monolingual children? Bilingual children refer to children being exposed to English and another language (for example, both parents speak Mandarin and the child goes to an English nursery).

We currently have 2 studies exploring this. In one study, children hear English and an alternative language such as; French, German, Italian, Cantonese, Mandarin, Polish and Spanish. In this particular study, the voice will sometimes be in English and sometimes in the additional language, for example saying, "Yesterday I saw a spoon" and soon after two images representing common words will be presented (for example, a 'bowl' and a 'bed'), sometimes one of these images will be related to the word at the end of the previous sentence and sometimes they will be unrelated. At the same time a voice will name one of these two pictures (‘bowl’). In this case ‘bowl’ and ‘spoon’ are the related objects. In our second study, the setup is exactly the same but this time the voice is only in English. Will the bilingual children be aware of the related words (the voice ‘spoon’ with the image of ‘bowl’) like monolingual children or not?

We have managed to test quite a few children so far and we can see from the results that bilingual children are aware of the semantic relations of words no matter whether the words are in their first language or second language!

**Bilingual Questionnaire (24 months)**

Our large-scale investigation for the assessment of English vocabulary for bilingual toddlers aged 24 months is still in progress and we are so thankful to all the parents that have taken part so far! We have had a great response from parents with over 1000 sign-ups. We are still looking for more toddlers coming up to 24 months in the near future (up until December 2015) who are bilingual. Please sign up and tell all your bilingual friends! Parents can register through an online sign up before their child turns two. Mums and dads are asked to indicate how much English and the additional language, e.g. ‘Danish’, their child hears during a typical week through a detailed questionnaire and to fill in a list of words their child know and say in English and in the additional language.

While Plymouth is the main base, the research team extends in the Universities of Kent, Birmingham, Liverpool, Oxford and Bangor to assist in speaking to the parents in the surrounding district areas. So far we have 230 children who have completed the study who are listening to specific languages however we would still love more, and specifically children who speak English and one of the following languages: Bengali, Cantonese, Dutch, French, German, Greek, Hindi, Italian, Mandarin, Polish, Portuguese, Punjabi, Spanish, Urdu, and Welsh. From the results so far, we have observed that children who have a higher exposure to English (e.g. spend more time in an English speaking nursery) will tend to have a higher vocabulary score in English. Furthermore, children who have a higher vocabulary score in their first language also tend to have a higher vocabulary score in their second language.
Political Development

Political Development (4 years)

This topic is very different from the kind of work we usually do. Here we are interested in how children acquire political attitudes. In particular, we want to know how parental political attitudes shape children’s acquisition of related concepts, such as sharing or meritocracy. In this study, parents are asked to fill in a questionnaire about their political opinions, and we don’t look at these data until long after the study is finished. Children are involved in two short games: one in which they have to split some tokens between themselves and another child (“economic games”), and one computer task where they have to sort out objects or characters depending on their positive/negative attributes.

We have tested children aged 6 to 14 in local schools so far, and in the Babylab we invite 4-year-olds, but also older children. Soon we will add up some tasks for the parents to complete as well. At the time of writing, I’d rather not disclose the main findings, which are really fascinating, as I don’t want to spoil it for visiting parents!

Picture Card Games

WinG: Words in Game (33-42 months)

Last year, we thought to have completed the adaptation of the Words in Game vocabulary test after having seen 400 children aged 19-37 months. Well, after the analyses of data we noted that despite the fact that many young children knew and said the names of few cards of the easy words, many older children did not reach the maximum peak, to recognise and name the whole set of cards. For this reason, we then extended the data collection to see a further 80 older children up to the age of 42 months in the Babylab. We have seen around 40 children and we would like to see many more children next year! After that, we aim to share this test with the health care professionals for the purpose of identifying children at risk of language difficulties.

BinG: Words in Game for Bilingual Children (32-36 months)

Bilingual children need to learn two languages during the same 24 hours a day that other children hear and speak one language only. Some bilingual children know fewer words than the children that speak only one language. We worked out in a previous study with 30 month old bilingual children that when bilingual children are exposed to at least 60% to English, the number of words that are learnt are similar to children that hear one language. This work was published in a specialist journal and awarded the best paper of the year 2014! We then expect to show the same results with older children using the WinG testing. So far we have seen 24 bilingual children, and we will see many more bilingual children over the next months! So watch this space!
Colour and Toy Preferences

Colour/ToyPref (18 and 30 months)

Generally, it is quite well observed that boys like to play with toys such as cars and trains, while girls typically prefer to play with toys like dolls. Girls also tend to show a preference for the colour pink, whereas boys might prefer blue. We want to find out whether the colour or the type of toy is more influential in determining children’s preferences towards the toy.

So far, we have tested thirty-one 18 month olds and twenty-five 30 month olds, by presenting pairs of pictures, one showing a stereotypically masculine toy and the other a stereotypically feminine toy. The colour of these toys was sometimes altered to reflect a typically ‘boyish’ or ‘girly’ preference, and we were interested in seeing how long the children looked at each picture.

We are just starting to look at the results, and it appears that boys prefer the masculine toy even when it’s pink, whereas girls opt for the girly colour and are swayed by pink even when it’s a boys’ toy!

WinGg: Words in Game with Gestures (24-36 months)

When we speak to someone face to face or even over the phone we move our hands, but children gesture a lot more when talking. Young babies begin to use gestures even before they begin to speak. The question is why do gestures accompany the speech? Why do children point or gesture when not requested to do so? Do children make use of gestures to reinforce the communication of the words that they cannot say the name for? For example, is it possible that if the child is not sure about the word ‘driving’ then s/he spontaneously produces a ‘driving’ gesture such as moving the hands in a way that reproduces the action of holding a steering wheel of a car. We also want to know if there are cross-cultural differences in the frequency of gesture productions.

This work is in collaboration with Australian and Italian researchers using the same WinG naming test. Not so surprisingly, Italian children did produce a lot more gestures than British and Australian children did. But Italian children also produced and understood more words than British and Australian children; these results show that living in an enriched gestural environment increases gesture and speech production.
**Homeopathy**

This study investigated the effects of flower essence on children’s tantrum behaviour and parental mood. Flower essence is a commercially available, homeopathic remedy which many find useful for the treatment of various problems. There is no pharmacological agent involved in flower essence and so scientists are attempting to understand how it works. This study was part of the investigation.

During this study, the frequency and duration of your child’s tantrums were recorded, as well as a record of your mood each day, in order to investigate the relationship between parents’ mood and the frequency and duration of children's tantrums.

**Xbox Kinect**

Imitation allows children to acquire new skills from watching others. People often see this as a relatively simple process, in which children copy whatever they see, irrespective of whether it is positive or negative, and especially if they are impressed with the other person. We are interested whether imitation is much smarter than typically believed. Do children evaluate the other person’s action and do they copy only those aspects that they think will help them meet their needs?

In our study, children get the opportunity to play a game of discus on the Xbox Kinect console. It is a fun computer game that the children play while we record their whole body movement. We are interested whether children will change the way they throw the discus after watching the throws of someone else, especially when the other person was very successful in his approach.

The study was funded by the Leverhulme Trust and the British Academy. We hope you find our experiment interesting!
This year the Babylab has been involved in a project called Education Through Expeditions, an organisation designed to inspire young people to learn more about the world around them. It aims to provide learning resources to be used in classrooms in schools to encourage young people to get involved in higher education. Lauran, Louise and Rebecca have been busy creating video blogs about the various projects in the Babylab, which are used in schools to provide an interesting insight into research methods.

It is a fun, enjoyable way to learn about science!

The research team is growing and works in close collaboration with staff and post graduate students. The studies were coordinated by Drs Caroline Floccia, Allegra Cattani, Laurence White, Patric Bach, Marina Wimmer, Ben Whalley, Claire Delle Luche, Rosa Kwok, Samantha Durrant, Michaela Gummerum and Beata Grzyb.

Some of the studies were run in partnership with Prof Kim Plunkett and Dr David Doyle from the University of Oxford, Katrin Skoruppa from UCL, Prof Sue Denham from Plymouth University and Prof Roy Patterson from the University of Cambridge.

Finally, you may have seen our PhD students, Bazah Almubark, Jacqueline Turner and Alshaimaa Gaber Salah Abdel Wahab and our Erasmus students, Milena Martinenghi, Inge Tamburrino and Valentina Valassina who came from Italy to learn about the work we do here.

Recruitment Events

You may have seen us at various baby groups and rhyme times in the local area to speak with you about what we do here at the Babylab. Thank you to all the children’s centres and libraries that have allowed us to come along, and to all of you who have supported us in our research.

You may have also seen us (and the bear!) on the street during November and March. Thanks to all those who stopped to say hello and register your interest, without you we couldn’t carry out our research so we are truly grateful to you and your children!

In addition to this, you may have seen us at weekend events such as the Barbican Pirate Weekend and the big Respect Festival at Plymouth University, as well as Mum2mum and NCT sales. All of these events were a big success and we had lots of fun promoting the Babylab!
Have your details changed since you signed up? If so, please tear this form off and send it back to:

**FREEPOST, Babylab—School of Psychology, Plymouth University, Drake Circus, Plymouth, PL4 8AA.** We will contact you as soon as we receive your form.

Name ________________
Address ________________________________________________________
Email __________________________________________________________
Telephone number(s) _____________________________________________

If you would like to contact us by email, our address is: plymouthbabylab@gmail.com

If you no longer want to participate in our research and would like to be removed from our system, please let us know by emailing the above address.