BABYLAB

Hello to all parents/carers and Babylab Scientists!

We would like to say a massive thank you to everyone who has visited the Babylab and taken part in our studies – we really appreciate your continued help and support. The research that we carry out here would not be possible without you! This is our 12th annual newsletter – we hope you enjoy reading about all the studies we have carried out and the exciting results we have gathered since September 2017!

We have had a really successful year so far – we have had over 670 visitors to the Babylab since September 2017. Many new studies have been started up and we have even filmed for a BBC documentary (read about this later in the newsletter)!

This year, we have had a number of visitors working in the Babylab. They have been working alongside the three placement students you will have met – Sophie, Mollie & Ella – who have been welcoming you in to the Babylab since September. We had eight undergraduate final year project students carrying out research for their dissertations in the lab, as well as four masters students and our PhD student Paul. Two Erasmus students from Italy joined us from September until December. Throughout their time here, they carried out research for the Babylab, as well as their own studies. One of the students even received an award for the best masters dissertation when she returned to her university in Italy. In the summer term, we had two French speech and language therapists visiting the Babylab gaining experience in a research setting, as well as Kate Kempton, a volunteer.

Sophie, Mollie & Ella will be leaving in July and will be replaced by three new placement students – Abigail, Flora & Laura – who will be carrying on the exciting research in the Babylab!

UNIVERSITY OF PLYMOUTH
School of Psychology

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Plymouth Babylab at University of Plymouth

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FARS (5 months)

Holly Mann, Lloyd Chilcott & Prof Caroline Floccia

When we hear someone speaking our language, we can pick out each individual word, like looking at beads on a string. However, when we hear a foreign language, picking out individual words becomes incredibly difficult. For babies who are starting to learn their native language, it must be a similar experience to hearing that confusing foreign language, and yet they somehow start to learn the puzzling new language and at around one year of age are able to speak their first words.

So how do very young children achieve this? In our study we explored if babies use the syllables they hear all the time, such as 'and' or 'too', to build up an understanding of words. We used the head-turn procedure and presented five-month-olds with commonly heard syllables, and very rarely heard syllables, to see if they recognised the syllables they hear frequently. About 30 babies have taken part so far and soon we will fully analyse the results. However, early findings suggest that infants of this age do not recognise the commonly heard syllables.

Mummy (5-12 months)

Prof Caroline Floccia & Paul Ratnage

Collaboration with Dr Thierry Nazzi, CNRS - University Paris Descartes

Studies show that consonants rather than vowels help adults in both word recognition and word learning tasks. Our research here is interested in understanding when infants first learn that the consonants of their native language are more beneficial to recognising a familiar word. Using the head-turn preference procedure, infants heard lists of the word "mummy" spoken either with its correct pronunciation or with alterations to either its consonants (i.e. "nummy" or "bummy") or its vowel (i.e. "memmy"). The results so far show that, at 5-months, infants are sensitive to vowel mispronunciations (i.e. "memmy") but not consonant changes (i.e. "nummy" and "bummy") to this familiar word. This finding is similar to the preferences found in French children at a similar age, indicating that babies begin life by attending more to vowel rather than consonant sounds. We are now currently testing infants between the ages of 8- to 12-months to see when infants may switch to attending to consonants.
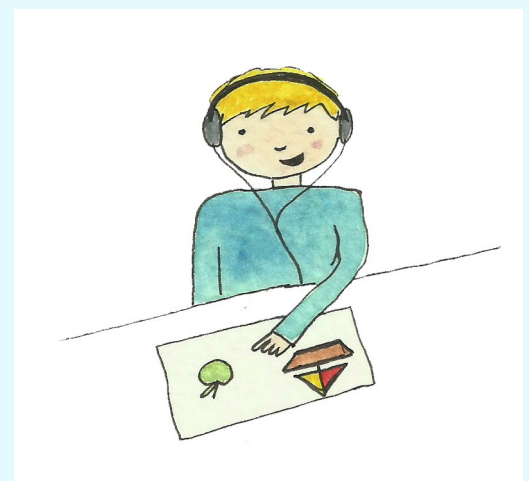
Frogs & Snakes (7-9 months)

Prof Caroline Floccia

Collaboration with Dr Julie Bertels, ULB, Belgium

There are certain animals that scare most of us: snakes, spiders.. It is likely that these fears originate from our very ancient past. Here we look at whether humans are born with an ability to detect certain evolutionary predators, such as snakes, and whether detecting these near us changes the way we look at and pay attention to our surroundings. However, previous studies were done by opposing snakes and plants, so we wanted to see whether the same effect is found when snakes are contrasted with other animals. We show infants between the ages of 7 and 9 months images of either a frog or a snake, using eye tracking, to see where they look, once the picture is no longer on the screen. We have tested 24 babies so far, and the analysis is underway.
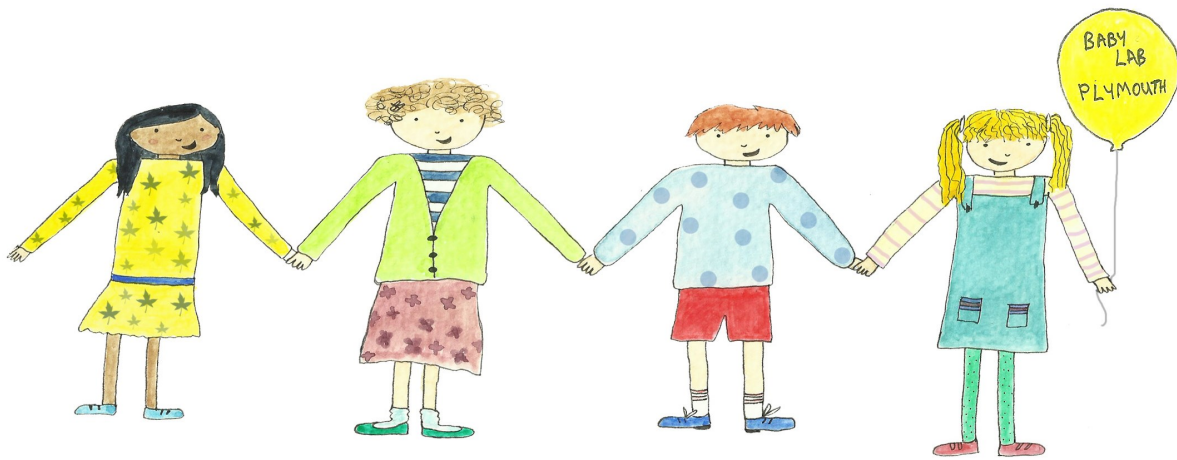
CV-SOA (9 months)

Prof Caroline Floccia

Collaboration with Dr Laurence White, University of Newcastle, and Dr Claire Delle Luche, University of Essex

There are many facts about our language that we know without knowing that we know.. For example, did you know that words can end up with a long vowel sound such as 'bee', but not with a short vowel such as 'bi'? Our brains know that and use this information to identify where words begin and end in speech. Here we looked at what age English-learning infants get this knowledge, so we present them with lists of sequences which are legal in English (the equivalent of bee) and lists which are not legal (the equivalent of bi). We expect that at 8 months, they would have learned about this regularity. We have tested 30 babies so far, and analysis is underway!

CVC 1 & 2 (11-12 months)
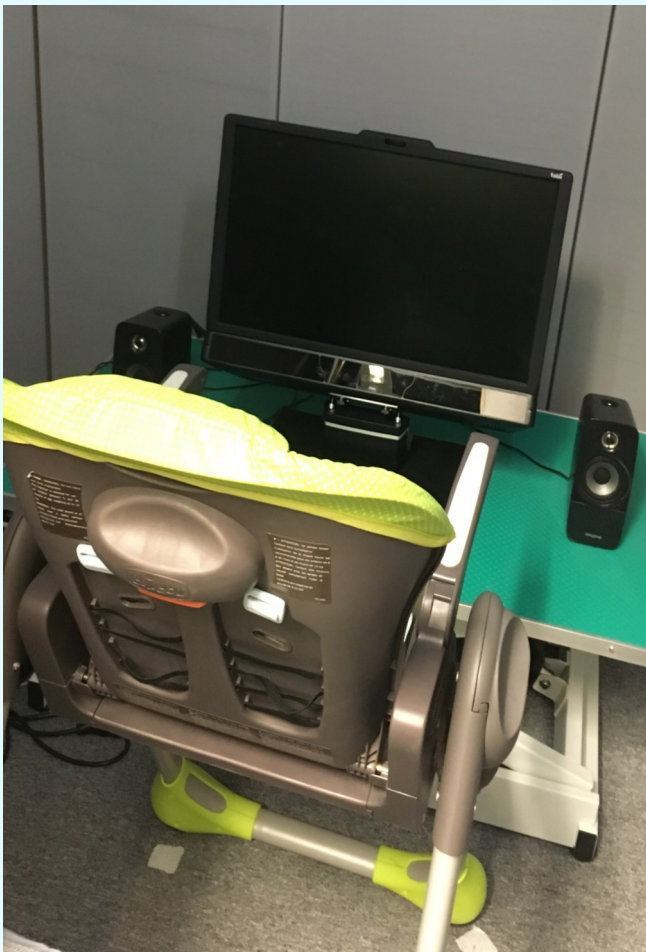
Prof Caroline Floccia

Collaboration with Dr Thierry Nazzi, CNRS-University Paris Descartes

French and English infants start learning their language with an interesting difference: when they approach their first birthday, French infants start paying more attention to consonant sounds than vowels, whereas English infants show no preference. Last year we explored this further by presenting 12-month-olds with lists of familiar words (cat, dog, etc..) in which we changed either the first consonant (dat, bog, etc..) or the vowel (cit, dug, etc.). If infants pay more attention to consonants than vowels, they should prefer the list with the vowel changes over the list of consonant changes, as they would judge the former to be more familiar than the latter. But we didn't find any preference, so we reasoned that these words were too short for English babies to detect these changes. So this year we ran a new version of the task, where words are longer (baby, bottle, etc...) and we have tested about 30 babies so far. Results yet to come!

Dot Grid/Line Orientation (7-9 months)

Dr Allegra Cattani

Our eyes move around and tell us what we see and how we focus our attention to then send signals to our brain. We know that each side of our brain become specialised for many things but we do not know whether these abilities stem from the ancestral brain 'division of roles'. A group of infants watched images of parallel lines (placed like a 'clock' face) in which one odd line was oriented differently. Children also looked at images of a black dot in the screen or placed inside a black grid. After having seen the results of 16 infants to add to the previous 65 infants from the past year, I was surprised to see how many of them spot the different line (or the dot) doing one straight movement of their eyes from the starting attention 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 but to do so many more children are needed!

Size Full (12 months)

Prof Caroline Floccia- Collaboration with Prof Roy Patterson from Cambridge University and Prof Sue Denham from our School

Most baby animals are born with the ability to 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 12-month-olds would be able to distinguish between an adult voice and a child voice, using the usual information found in voices: vocal tract length information and pitch. 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 voice quality of an adult or that of a child.

We have tested 46 babies so far, including 32 with the video setup and 14 with the eye tracker, and results are unexpected, as we find no effect at all: infants do not match the speech information to the corresponding speaker. It is difficult to decide what it means: either children need more exposure, or we didn't provide them with enough information. It is likely we will test a group of 3-year-olds next year to try and see at which point the task can be done.

SemCast15 Asso800 (15 months)

Prof Caroline Floccia

*Collaboration with Prof Kim Plunkett, University of Oxford*

In 2014 we published an important 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 related questions, which would allow us to examine whether infants recognise words with the same kind of mechanisms than adults. This is not a trivial question as there is much debate around the origins of word knowledge. The question we asked here 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 that pairs of words are presented instead of a long list. So far 22 infants took part but results have not been analysed yet.

Scale Error/Shape Bias (18-19 months)

Eleanor Cosgrove, Dr Allegra Cattani & Prof Caroline Floccia in collaboration with Dr Beata Grzyb, UCL

Toddlers sometimes seriously attempt to perform actions with toys which are impossible because of their size, for example trying to step into a miniature car. These scale errors have been studied in our lab over the past years, and we are currently examining whether there is a link between the emergence of these scale errors, and the emergence of the "shape bias" in early childhood. The shape bias refers to the fact that children prefer to categorise objects based on shape rather than colour or texture. So in this study, children are placed in a play situation where the toys are the appropriate size, and then the same toys that are too small, and we measure the number of scale errors. Then they play with the experimenter an object sorting game where we look at the extent of their shape bias. About 10 children have been tested so far, and the feedback is that many scale errors are observed so far, which is brilliant!
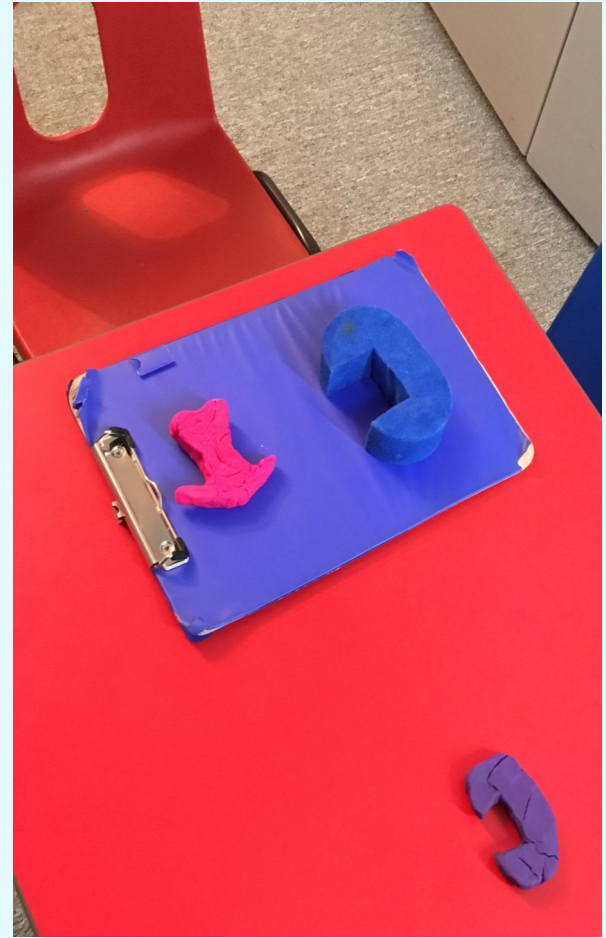
GARP (20 months)

Drs Claire Delle Luche & Prof Caroline Floccia

Children brought up in the South West of England hear this r-sound in words like car, but they also understand the other, non rhotic, pronunciation. If we teach new words to these children without the r-sound, do they extrapolate how it can be pronounced with the r-sound, or do they need to hear both version? In order to understand how children learn new words, this study shows cartoons teaching new words, and we are measuring their eye movements to see how "well" they learn the version with and without the r-sound. This study is working in collaboration with Essex babylab and we have tested 25 babylab scientists here in Plymouth Babylab so far!

Cat. Link (21 months)

Prof Caroline Floccia & Mollie Williams

At the age of 6 months, children begin to group words into global categories such as animals and vehicles. Previous research has demonstrated that 18-24 month infants are sensitive to categorical membership, e.g. displaying two object from the same categories such as an apple and banana causes a delay in the infants recognition of the object they were asked to identify. This is due to the similarity between the objects causing confusion due to the properties they have in common linking the words together in the child's vocabulary. In this experiment we are focusing on the categories of animate (living) and inanimate (non-living), to see if the words within the categories are linked at the age of 21 months. Infants will be presented with two images and instructed to identify one of the images e.g. look bear. The image pairings will either be two animate image or two inanimate objects. We have seen 15 infants for this study so far and hope to continue testing more!!

Word Link (21 months)

Prof Caroline Floccia, Andromachi Paparvaniti & Emma Jones

Toddlers' vocabularies usually increase very quickly between their first and second years of life. How is their ever-growing network of words organised in their heads? Adults' vocabularies consist of approximately 50,000 words, which can be very efficiently recognised, within a few hundreds of milliseconds. How does such an enormous network begin to build in infancy?

One theory suggests that young children learn words best through the associative links between objects in their environment, and older children/adults learn best through the basic-level categories to which words belong. In our study, we use an eye-tracker to test the links between words in 21-month-olds. Children's eye movements towards images are tracked on a computer as they hear pairs of taxonomically related (dog/bird) or associatively related words (dog/bone).

When infants are presented with either 2 images belonging to the same category (e.g. dog/bird), or 2 images that serve a complementary function (dog/bone) will infants attend longer to the image in the second condition when prompted with an audio (e.g. look, dog)?

We are expecting to include 24 infants in our study, with 17 infants having already participated.

BP3 (26-29 months)

Dr Claire Delle Luche & Prof Caroline Floccia

What does "bébé" mean in French? Baby! Words like bébé-baby are known as cognates and it has been shown that bilingual adults will recognise such words more easily. We want to see if this is also the case with children with this study where we name objects, which names are cognates or non cognates ("canard" is French for duck). We want to see which ones are recognised the easiest by tracking children's eye movement, and cognates are easier... but only for children who are learning a "close language" like Dutch or French, pretty much like what is observed with adult bilinguals. Currently we are testing monolingual in the Babylab to match with bilinguals tested in other babylabs over the country.

Cognate 2&3 (24-27 months)

Dr Claire Delle Luche

This is the "next episode" for BP3: Cognates sound very similar, so why would one remember the very precise sounds making up the words? For bébé-baby, expecting "b-b-" might be just enough. These two studies are presenting children with words pronounced slightly incorrectly, to see if children indeed would have an approximate expectation of words like bébé-baby (for a French-English bilingual child) or a very precise one. We are still trying to find bilingual children to help with this study, so if you are parent (or know a parent) of children around two years old that are hearing Dutch, German, French, Spanish, Italian, Polish, Portuguese or Greek, do get in touch!

EmCues 3, 4 & 5 and Cue 2 & 4 (2-5 years)

Beverly Plester, Amy Stock & Sandy Hotait

Building on last year's finding that two-year-olds correctly matched emoji faces with human facial expressions about half the time, but had trouble distinguishing among negative emotions, Amy studied two- and four-year old children to see if they could rank emoji accurately along a positive to negative continuum. Matching positive or negative was easier than matching the intensity of emotion, and, as expected, four-year-olds were more accurate than twos. This has implications for asking very young children to pick an emoji to describe, for example, how much they hurt.

Sandy studied three- to five-year-old children's accuracy in picking emoji that represented what a character in a story would feel, comparing being told a story with seeing an illustration of a story. For all ages, the extra information available in a picture made accurate choices of emoji easier than depending on a spoken story, which the child would have to reason about before choosing.

Next school year, we plan to study a wider range of children, from three to eleven, to see if emoji choices can accurately identify a story character's emotion across a range of emotions, and demonstrate a clear progression through nine stages of development of emotional understanding.

WinG Reliability (45-49 months)

Dr Allegra Cattani, Maggie Chinunka & Emily Oputa

This study aimed at improving the photograph images of the WinG vocabulary assessment test. We fist asked a sample of psychology students which pictures they thought were not best representing the word target. The pictures that had the lowest scores were replaced with new images.

Then in the babylab, we asked the children to take part in the Wing vocabulary assessment test using the replaced pictures and compared the performance with same age children to assess if the new pictures improved the children' performance. Our preliminary analyses have shown that both pictures were equally good and that the difficulty for a label was related to the maturity of the child's

BinG: Words and Gestures in Bilingual Children (36-41 months)

Dr Allegra Cattani & Prof Caroline Floccia

We believed these bilingual children would use the gestures more often than monolingual children to compensate to enhance effective communication. Thanks to your support, we saw 6 children, and we do really need to see many more bilingual children over the next months! Along the years we saw in the babylab 31 children aged 37-41 months and so far we found that some children produced more gestures than others and that monolingual and bilingual children did produce a similar amount of gestures!

Mums and dads of bilingual children, please do help us in bringing your child to the babylab to see how many words your child knows and says!

PAS (48—55 months)

Dr Allegra Cattani & Greta Chiodi

This study aimed to investigate the influence of the oral language on the phonological awareness in a cross linguistic perspective. of English and Italian pre-reading skills children. Previous research has shown that oral language influences the development of phonological awareness in infants. Given the different phonological characteristics between English and Italian, it is our intention to compare English children to Italian ones in some oral tasks.

To do this we asked the children to take part in two games, a tapping syllable and a blending syllable task. Children listened to words and non-words in English and foreign language (Italian) from an iPad. Children took part also in a semantic fluency game, where your child was asked to say in two minutes all words associated with animals and food (one minute each) he/she can think of.

Thirty-one children visited the babylab and some children were playing happily whilst others still had to learn the syllable pattern. When children were asked to fuse the syllables (i.e. put them together) they did worst in the non-familiar language than in English. And when children were able to distinguish the syllables (on the tapping game) of non-words in English, they were equally able to perform on the non-word in a foreign language. So the children's acquired skill of syllable awareness is extended to an unfamiliar language that has different syllabic rules.

Accent VS Accuracy in Infant Word Learning (3—5 years)

Prof Caroline Floccia, Paul Ratnage & Sophie Olver

Past research has shown that children 'prefer' a person when they have an accent similar to their own, compared to someone with a foreign accent. This study looks at 3-, 4-, and 5-year-old children's preferences for learning new words from either a local accented (Plymouth) speaker or a regional (Welsh or Scottish) speaker. Children are presented with a novel object and both speakers give the object a 'made up' name. It is predicted that all children will agree with the informant with a Plymouthian accent. We are also looking at how the accuracy of a speaker influences the decision of young children. Both speakers will also name familiar objects – one will always be correct and the other will always be incorrect. The child is then presented with novel objects again. It is predicted that whilst younger children still agree with the local accented speaker, older children will agree with the accurate speaker, regardless of accent.

Accent Preferences (5-6 years)

Prof Caroline Floccia, Paul Ratnage, Nicole Day & Dani Curcic

A speaker's accent provides a variety of information about their social, regional, and ethnic background. Research in adults shows that we typically rate those who speak with our local accent more favourably than those who speak with either a regional or foreign accent. In the first study here, we examined whether children also show this bias towards individuals who speak in their local accent. Children played a short game on an iPad to see whether they would prefer to be 'friends' with an individual who shared their accent in comparison to either a foreign or regional accented speaker. The results showed that 5-year-old children were more likely to select those who shared their local accent to be their friends. In a second study, we looked to see if this accent preference was mediated by the content of the sentences each accented speaker spoke. In particular, would children prefer a 'nice' regional or foreign accented speaker over a 'mean' local speaker? The findings here indicate that 5-year-old children preferred 'nice' over 'mean' speakers when they spoke in a regional accent, but still showed a preference for a local accented speaker over a foreign accented speaker irrespective of whether they were 'mean' or 'nice'.

BBC Documentary

On the 14th May we had an exciting visit from Voltage TV, who were filming a documentary for the BBC, that you will be able to see on BBC 2 in the Autumn! This programme, the "Wonderful world of babies", features important changes or stages in the early years. In our Babylab they filmed an experiment showing that up until 10 months, infants can hear speech sound differences that us, as adults, can no longer hear. This is very useful to them to learn any language, of course. Six families with infants aged 6 months to 12 months came to participate on that day. It was intense but we had a lot of fun! Thank you to all the parents and Babylab scientist that took part!

Recruitment

This has been another busy year of recruitment. We have enjoyed seeing a lot of familiar faces and meeting a lot of new ones. Thank you to events such as the NCT nearly new sale and Broody to Baby and Beyond groups, we have enjoyed being part of your events over the year. A massive thank you to Babysensory, your sessions have been so useful in recruiting new mums who are interested in coming into that lab. Thank you to all the Chatterbox session; Green Ark, Plymouth Christian Centre and Plympton Youth Centre, Bumps and Babies and all the libraries that have let us visit their Rhyme time over the year. The research we do in the Babylab would not be possible without the support of these baby and toddler groups!

Thank you to all the children who have taken part in our research.

Illustrations by Kate Kempton

UKBTAT

Prof Caroline Floccia

The Babylab is very proud to have produced a new test for detecting language delays in 2-year-old bilinguals, the UKBTAT. It is the result of a 3 year collaboration with other universities in the country, and it is available freely online for practitioners to use (http://www.psy.plymouth.ac.uk/UKBTAT/).