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Infant and Toddler Language Studies
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Dear Parents,

The nights are rapidly drawing in so it's time we dropped you all a line before preparations for Christmas start in earnest. Hopefully the postmen will stop striking soon to ensure speedy delivery of this, our latest newsletter to you all. We write these newsletters twice a year to everyone who registers their baby with us, to keep you posted about our latest projects and any new findings. For those who have signed up their baby recently, a very warm welcome. We hope you will find it fun and rewarding taking part in our studies. And to those who have already taken part, thank you once again for your time and for letting us meet your baby. We are sure that he or she will have grown and changed so much in the weeks and months that have passed.

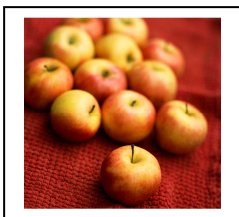


1. Another new grant

We have a new study for toddlers, and this gives us a nice excuse to visit some of you again and see just how much your babies have grown! We have been awarded a major grant from the Economic and Social Research Council to study children aged 24 months. The study will look at how words are learned and used. As we have mentioned in our previous newsletters, we have found that at a certain point in their vocabulary development, most toddlers form word patterns (which we call *templates*) to use as a building tool. Each child develops a slightly different pattern or set of patterns. The templates are based on the sounds that the child finds easiest to produce. We believe that children filter the speech that they hear as well as what they want to say through their templates.

In York, we are following the development of six toddlers over the course of a year, looking at when they start to use templates, how they use them and when they stop using them, making their speech sound more like an adult's. In another part of the study, we're going to see over 30 toddlers, filming them at home to assess their template use before asking them to take part in some fun experiments here at the university. The experiments investigate how templates affect the way that children recognise words and learn new ones. We use a book-reading task and a game where children move toys around in a set of plastic boxes.

Assuming children all over the world use templates to help them learn words (the templates varying from language to language because of the different sound patterns involved), we also wanted to study children abroad who aren't learning English. Therefore colleagues in Paris and the Lebanon are working with us on this grant, studying toddlers learning French and Arabic. We have never taken on such a global enterprise before and are really excited about its possibilities.



2. Babbling Babies: Dynamic Interactions Between Production And Perception

We are now in a position to report the preliminary results of our big "Babbling Babies" study, which ran from July 2007 to February 2009. We followed 59 babies in York between the ages of 9 and 18 months, watching their language grow from babble into words. "Babble" for us means when a baby uses strings of syllables that begin with a consonant, such as "dadada" or "babababa". We filmed babies on a weekly basis from the age of 9 months and then cut these visits down to once a month when the baby began using at least two consonants regularly in their babble. At the ages of 10 and 11 months, babies came into the lab at the university to do "head turn" experiments. Head turn experiments are our main means of testing babies and run as follows. Parents sit in a soundproof booth with their baby on their

lap. The baby hears words and sentences through speakers positioned on either side of their head. Lights next to the speakers flash to get the baby's attention before the sound starts. All we do is measure how long the baby keeps their head turned towards the speaker while it is playing the sound. Parents have to listen to jumbled-up speech through headphones to stop them inadvertently influencing their baby's reactions. In the Babbling Babies study, the head turn experiment at 10 months investigated whether babies preferred listening to words which were familiar to them (e.g. *mummy*, *cuddle*) or words which they were unlikely to have heard before (*tendrill*, *gecko*). The words were played in lists. The experiment at 11 months investigated whether babies could then pick out familiar words embedded in a slightly nonsensical sentence (e.g. *the mummy will have cuddled again*).

We analysed the results by looking at the interaction of various factors: a) the age at which the babies gained two consonants in their babble repertoire, (b) the baby's "looking times" in the experiments, (c) the age at which they said their first four words on camera, (d) how many words they had said on camera by the end of the study and (e) how many words parents thought their babies could say and understand. (We gave parents monthly questionnaires to gain a more complete picture of each baby's abilities because some babies were very shy on camera!)

What was clear when assessing the data was that babies are very much individuals and it's difficult to draw out general trends. Head turn experiments are also unusual situations and not every baby would sit still for long enough to pay attention throughout, however linguistically advanced they were. Out of the babies who had acquired two consonants by the time they came in for

the 10 month head turn experiment, some preferred listening to the familiar words whereas others preferred listening to the unfamiliar words. But we considered both groups to be able to recognise familiar words – one group was recognising and focusing on them whereas the other group was recognising and then rejecting them in favour of something new. Babies who didn't have two consonants in their repertoire by 10 months didn't prefer one list over the other. This shows us that babbling helps babies remember the words that they hear around them. The babies who acquired two consonants early on and who did well in the 10 month word recognition experiment were also the best at recognising familiar words within a sentence at 11 months. This shows us that babbling and the ability to recognise isolated words both help babies to split a stream of fluent speech into word-sized portions.

Babies all develop at their own rate. Some babies were saying only a few words per session on camera by 18 months, whereas others were saying nearly 70. (The average score was 18.) The age at which babies acquired their first two consonants in babble correlated significantly with the age at which they said their first words on camera.

So in sum: babbling is a crucial stage of a baby's language development and leads on to exciting new comprehension and production skills! Things won't stop here. We will be integrating some of the data into our toddler templates study as we are continuing to follow some of the children. And one of our colleagues in America, an expert in sign language, is studying several of our videos to see how babies' acquisition of babble compares to their early use of gestures. She will compare the gestures of babbling babies to the gestures of (1) babies who are born deaf and therefore learning sign language instead of spoken speech, (2) hearing babies born to deaf parents who are therefore learning both sign language and spoken speech, and finally (3) hearing babies doing "baby sign" classes. A lot of you do "baby sign" so the results of group (3) will be especially pertinent.

3. Babies in Britain and America: update



We wrote about our other current study in our spring newsletter. This study is investigating how parents interact with their babies in Britain and America and whether any differences in speech style (social or acoustic) might have an effect on rate of language development. In the past, American researchers have found that American babies are more advanced than British babies at understanding speech and learning words. We are doing lots of head turn experiments in York and Harrisonburg, Virginia (where our American colleagues are based) to work out at what age babies start to recognise a word played over and over again at the start of the experiment when that word is then embedded within a sentence later on in the experiment. We are also going to play British

recordings to American babies and American recordings to British babies to see how this affects the results. If the American speech proves easier for babies to process on both sides of the Atlantic, we will do acoustic analysis to try and work out why.

To study social environments in both countries, some families in Britain and America are being loaned a digital recording device called LENA over a weekend. LENA has been specially designed for babies to wear all day. It can record up for to 16 hours and fits into a special vest. LENA enables more natural data to be captured (with no observer present) and it means we can record babies' babble when it is most prolific (often just as babies wake up or go to bed; times when we wouldn't normally be there filming). The device can be switched on and off whenever parents want. As most of the recording is automatically processed by a computer we don't actually listen to much of it. We give the families two story books as a present and ask the mums to read the books to their babies twice over the weekend and to note when they do this in a diary of their activities. The same books are being used in York and Virginia, so we should get some nice speech samples to compare. We expect this study to give us some really interesting findings.



4. Production Influencing Perception



Many of you took part in a study in the spring where we filmed your 8-9 month old baby on a weekly basis for a few weeks. Once your baby started using a "favourite" consonant regularly in their babble (usually a "d"!) we invited you into our lab to do a head turn experiment, where your baby heard sentences full of nonsense words beginning with either their favourite consonant or a consonant that they hadn't yet learned to say.

This proved to be a very difficult study for us as it meant trying to catch a baby at a very specific stage of language development. As we found in our Babbling Babies study, once babies start to babble, they begin to learn very quickly. So if a baby was only using one consonant on a Friday, by Monday or Tuesday of the following week they might have added two others to their babbling repertoire, which meant they performed differently to our expectations in the experiment. So despite seeing over 40 babies, we don't yet have enough concrete results to share with you. As we have our two other big new grants to work on, we've had to suspend this study for a little while, hoping to resume it in the New Year. Watch this space!



That's all from us for now. As usual, we end with a plea for more volunteers to take part in our studies. So if you have a friend or relative with a young baby aged around 8 months or a toddler under the age of 2, please tell them to get in touch! They can call Rebecca in the lab on (01904) 433619 or send an e-mail to linguistics-babylab@york.ac.uk. So we can keep in contact with you, please also let us know if you move house or change your phone number after registering.

Wishing you a very merry Christmas and hoping to see you all in 2010, with best wishes from the Infant and Toddler Language Studies team at the University of York and James Madison University, Virginia:

Marilyn Vihman, Tamar Keren-Portnoy, Rory DePaolis, Rebecca Dodgson, Amy Bidgood, Michelle McGillion and Helena Sears