



How the Language 0-5 Project is helping us find out what's really going on

Learning about **Language Acquisition**

Amy Bidgood, Research Associate at the University of Liverpool, outlines how her team have been investigating Child Language Acquisition, using a wide variety of different research approaches to get a complete picture of all the factors involved.

By the time they start school, most children are already fluent speakers of their first language. In just four years, they've learnt how to pronounce the sounds of their language (which is harder than it might seem!), they've learnt the meanings of hundreds of words, and they've learnt how to use grammar to put all of this together. In fact, for typically-developing children, language acquisition might seem like a pretty straightforward process that doesn't require much effort – it's not like trying to learn a new language at school. But is it really as easy as it seems?

In reality, some children acquire language a lot faster than others, and not all children start school with the language skills they need. Research has shown that children who start school with small vocabularies tend to struggle with literacy, and this

can have a knock-on effect throughout school. Here at the University of Liverpool, we're trying to find out why children learn language at such different rates, and why some children fall behind their peers. In the Language 0-5 Project, part of the LuCiD International Centre for Language and Communicative Development, we're following 80 children from the very beginnings of language development, at six months, through to school, at 4½ years. This is the biggest project of its kind in the UK and will help us build the most comprehensive picture yet of children's language acquisition.

Getting the Right Information

There are many different ways to study children's language development. For example, parents can fill in questionnaires



about their children's language. Communicative Development Inventories (CDIs) are lists of words that young children typically know – words for members of the family, names of animals and toys, and other handy words like 'again', 'more' and 'no'. The Language 0-5 parents complete CDIs on a regular basis, so we can see how their vocabulary is developing. However, some parents are quite conservative when they fill in the form and only tick words they are absolutely certain their child knows; other parents are much more optimistic and tick every word their child might have heard. Although most parents fall between these two extremes, CDIs can be a fairly subjective measure of what children know.

One way to avoid this problem is to use standardised tests. These tests have been used with thousands of other children, and the results allow us to compare the children in our study with the general population. Because we run the test with all of the children in the same way, we can be more objective about their development. The Language 0-5 children first take part in one of these tests when they're just 16 months old. For the children, it's just like a series of short games – we ask them to do things like point to pictures in a book, point to different parts of their body and tell us the names of everyday objects. However, this type of test isn't a perfect measure of what children know either. If the children are shy or haven't had their nap when they come into the lab, they might not show us everything they can do.

To see what how the Language 0-5 children act when we're not there, we give video cameras to the families, so they can record

what's going on at home. Every six months, they record two hours (not all in one go!) of parent and child playing together. These videos provide a rich source of information for language researchers. As well as getting an idea of how much the children are saying and what sort of words they know, we can see things like the gestures they're using, the toys they like to play with and how they interact with their parents.

Perhaps studying children's language in their home environment seems like the best way to learn what's really going on, but this method isn't without its problems either. First of all, it is very time-consuming for researchers to transcribe and code everything that happens in the videos. Secondly, there are so many different things to look at, it can be hard to decide what is most relevant. CDIs and standardised tests are both much quicker and give us a simple number with which to compare the children. Finally, video data only gives us a small snapshot of a child's life – we don't know what happens when the child is at nursery and we don't see how they act around siblings or when they're in the bath, for example. We also often miss things that only happen rarely, such as certain types of grammatical error the children might produce.

The Language Lab

As well as observing what children do at home, testing their language knowledge and asking their parents to fill in questionnaires, the Language 0-5 families come into our Language Lab here at the University of Liverpool to take part in lots of experiments. The experiments we run change over the course of the project, as the

From the Language 0-5 project.
With permission of the Language 0-5 project



children get older and know more about language. However, we start running the experiments when the children are just 9 months old – before many of them are saying their first words.

For some of the experiments, we use an eye-tracker. The eye-tracker has a very high-speed camera to tell us exactly where babies are looking on a computer screen while we show them different images. For example, when the babies are 19 months old, we investigate how quickly they can process speech. We do this by showing them pictures of two objects, like a book and a car, at the same time. While they're looking at the pictures, they hear a voice saying, for example, 'Look at the car! Do you like it?' The eye-tracker tells us exactly how long each child takes, from the moment they hear the word 'car', to look at the correct picture. This is important because a previous study has suggested that children who can do this faster also tend to have bigger vocabularies.

Other experiments are more interactive. For example, when the babies are 11 months old, we ask their mothers to look at some interesting picture and objects on large display boards with them. The children like looking at the objects – particularly the shiny tinsel and the rubber duck – and they also like waving at themselves in the mirror. What we are really interested in, though, is how much pointing the babies do. Using

gestures, like showing toys to other people and pointing at things you want to draw someone else's attention to, is an important step in pre-linguistic communication (before babies can talk). Previous research has shown that babies who start pointing earlier tend to have bigger vocabularies by the time they're 18 months old. We want to see whether differences in the amount of pointing babies do when they're all the same age is important, too. We can also investigate why pointing is important for language development. One reason might be related to how parents respond to their children's points: by pointing at something they like the look of, children might encourage their parents to name that object, thus helping them to learn extra words.

Language Input

Finally, and importantly, we're studying the language input that the children get at home. As well as video recordings, we use a device called LENA to record a full day in the baby's life every three months. We then plug LENA into the computer and it automatically tells us how many words the baby has heard and how many utterances they said themselves (it can't tell the difference between babble and words, though!). It can also tell us when in the day there was most talking, and other things like the amount of time the babies have spent watching TV. We can get large quantities of information very quickly from

LENA. However, it doesn't tell us what was being said and can't tell us if the baby was just overhearing a conversation or if their parents were talking directly to them. This is why we also need information from the videos and questionnaires.

Bringing Everything Together

The children in the Language 0-5 Project take part in a great variety of different studies, and this makes the project unique. For the first time, we'll be able to see how pre-linguistic gestures, processing speed, the home language environment, and many other factors all work together in child language acquisition, over the first five years of life. If we only looked at one or two of these things, we wouldn't be able to get a complete picture. By the time the project finishes in 2019, we'll know what the most important factors are in identifying children who are at risk of falling behind, perhaps even before they can talk, and this means we might be able to give them and their families extra support to stop this happening.

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