Language Learning Lab Newsletter December 2018

https://languagelearninglab-ucl.com/

Dr Elizabeth Wonnacott

In the **Language Learning Lab,** we are interested in many different aspects of language learning. Some of our research investigates how to help children (and adults) learn a second language. When children learn a language naturally, for example, if they move to a new country where the language is spoken, they are generally very successful, and ultimately more so than adults in the same situation. However, research has shown that when they are taught foreign languages in the classroom, younger children are generally *slower* to learn than either older children or adults. We have built games which we can use to teach children languages such as Mandarin Chinese, Spanish and Japanese, and we use these to explore the factors which could help children learn languages in input limited contexts. In other experiments, we teach children and adults artificial (i.e., made-up) languages. An advantage of this approach is that that our experiments can be very precisely controlled. We are using these methods to explore lots of different questions, including how we learn complex word meanings, and how children learn to spell.

None of our work would be possible without the schools who work with us and the many wonderful children who participate. Many thanks are also due to the teachers who attended our *"Second Language Learning in the Primary Years"* teachers' workshop last June. It was fantastic to get the opportunity to tell you about our research, and we certainly learned a lot from your feedback! We hope to hold another event soon.

Below are just some of the projects the team have worked on this year, we hope you will enjoy reading about them.

Happy New Year!
Dr Elizabeth Wonnacott, Lab director

Research projects

Learning tones in Chinese: 70% of the world's languages use "tones" to change the meaning of the word. For example, in Mandarin Chinese, "ma" with a high flat tone means "mother", but if you say it with your voice falling then rising it means "horse". This is difficult for speakers of languages like English, where tone isn't used in this way. Our work has shown that 7- and 11-year-olds can pick up tone differences by playing a word learning game, without any explicit teaching, although their learning is quite slow. What factors might improve performance? **Gianna's** experiment explored whether children can learn the tones better if we teach them with hand gestures which they can associate with the tones. She found that they could learn these gestures and that they found them helpful in identifying

Gianna Li
Native speaker of Cantonese

Example gesture for rising tone

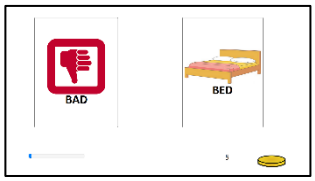
the tones. However, when the gestures were removed, their performance was impaired compared to children who learned without gestures. This suggests that though gestures could be a helpful tool for children in remembering the tones, it is important to ensure that they do not become too reliant on them when learning Chinese words.

Hanyu Dong
Native speaker of Mandarin Chinese

Hanyu's project focuses on individual differences in adult learners of Mandarin. He has found that measures of working memory- the system which holds information for language processing–predicts the ability to learn for all learners. In addition, for those just beginning to learn the language, attention is an important predictor, while for those who have been learning for a while, musical ability plays a role. In future work, we hope to explore whether these same factors are relevant for children's learning

Learning new speech sounds: One difficulty in learning a new language is learning its speech sounds. For example, Dutch learners find it difficult to hear the difference between the vowels in "b**a**d" and "b**e**d", so that they sound like the same word. Past research has shown that adult can be trained to hear these, but that this works best when they hear multiple talkers say the words. **Gwen** asked: is this the case for children too? In her study, Dutch 7- and 11-year-olds played language games every day for two weeks, where they were trained on English words containing difficult English vowels. After those two weeks, we tested if they had improved their ability to tell the difference between the English vowels, and how well they learnt the words these vowels were in. The results showed that the children could learn in the games, but actually found them easier when there was only *one* speaker rather than multiple speakers. Importantly, unlike in previous adult studies, having heard one or multiple speakers in the language games made little difference to how much they learnt from the training. This shows that findings from adult language learning do not necessarily transfer to children!

Gwen Brekelmans
Native speaker of Dutch



***Learning a new grammar*:** As well as learning the words of a language, we also have to learn aspects of the grammar. For example, many languages divide nouns into different "gender classes" which affects the words they combine with. For example, in Spanish, if you want to say "the bed" the word for "the" is "el" ("el libro") because "libro" is masculine, but in "the house" the word for "the" is "la" ("la casa") because casa is feminine. English learners often have difficulty with gender. Our experiments have shown that 7-year-olds can naturally pick up on these patterns of usage when learning words via a computerized game, however they have difficulty extending the patterns to new words (they don't learn that, in general, words ending in "-o" go with "el"). **Gabby** explored whether "recasting" – a type of correction where children try and say the word then hear the correct version – would lead to better learning. Although there were no overall differences between children who did and did not hear recasts, she did find that children in the recast group actually did better if they made *more* mistakes during learning. One explanation is that this is because they had more opportunities for correction. We will be following up this finding next year!

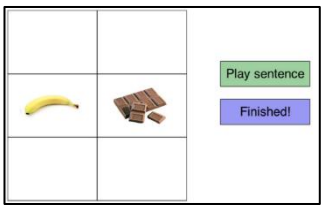
Gabriella Gamberini
Native speaker of Spanish

Learning word meanings: When you hear the word "bridge", it is likely that you will see a bridge – either in your environment or in a picture. But how do we learn the meanings of abstract words such as *above* or *below*? Imagine you have never heard English before. Someone says: "The river runs below the bridge". How do you know what *below* refers to – the river, the bridge, "the sky is so beautiful today!", or something else? Relational words like *above* or *below* seem particularly tricky because they can be used with many different nouns ("below the bridge", "above the ground", "below the table" and so on). However, theories of language learning suggest that varied contexts are actually helpful. If you hear *below* in lots of varied contexts, you will realise that nouns and the objects they refer to vary across these contexts, but what is shared is the abstract quality of something being *down* relative to something else. But if you only heard *below* in the phrase "below the bridge", you can't be certain what exactly it refers to.

Maša Vujović

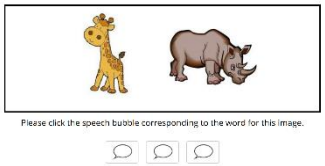
Chantal Miller

Chantal and **Masa** investigated the idea that variability helps learning in an experiment. They taught Y3 children the Japanese words for *above* (*no ue ni*) and *below* (*no shita ni*). We developed a computer game in which children heard sentences like: *banana o chokoreto no ue ni oku* (meaning *put the banana above the chocolate*) and were asked to move corresponding pictures on a grid. One half of the children heard *no ue ni* and *no shita ni* in two different sentences each, and these sentences were repeated multiple times. The other half heard the two words in 28 different sentences each. We predicted that the children who heard the words for *above* and *below* in lots of different sentences would be better at learning the meaning of the two words. That is exactly what we found: when we played children sentences containing new nouns they hadn't seen during practice, only the children who had practised with lots of different sentences were able to move the correct picture to the right location. Apart from supporting the idea that variability helps in learning, this study was important because we developed a new, engaging experimental game which can be easily adapted to study different aspects of language learning.



Catriona is also investigating how we learn the meaning of relational terms in contexts where there is more than one visible relation. For example, imagine you are learning a relational word in a new language. Your teacher points at a giraffe and a rhino sitting close together and facing apart, and says a word. Does this word mean 'close together'? Does it mean 'facing apart'? If you later see a tiger and a camel close together but facing each other, would you use this word to describe that scene or not?

Dr Catriona Silvey



She has conducted artificial language experiments – so far with adults – where they learn new words for scenes like this and try to figure out which relationship is relevant to the word's meaning. One factor that is important is salience - it might visually 'jump out' at you that the

giraffe and the rhino are close together. However, as in **Masa**'s work, *variability* is also important: learners are better able to learn relationships that they have seen in more varied examples (e.g. if they have seen lots of different animals facing apart). Interestingly, which of these factors a learner relies on depends on whether they are producing the language (picking a word to describe a scene) or comprehending the language (picking scenes they would describe using a given word). In future work, we aim to see how this changes when learners have to communicate with each other. This work tells us more about how language learners figure out the meanings of words like 'above' and 'below', and also gives us clues to word meanings that might be easier or harder for a new learner to get to grips with.

Literacy: Learning to spell

Dr Anna Samara **Daniela Singh**

Daniela and **Anna** are interested in the development of literacy and have been looking at how children learn to spell.

Spelling in a language like English seems so unpredictable-some vowels have as many as five different spellings! However, there *are* patterns, and learning these is part of learning to spell. In the Language Learning Lab, we are conducting experiments with primary school children (7-8 years) to uncover how they learn these patterns and exceptions. For example, do children require direct instruction to learn the rules, or can they pick them up from mere exposure to text?

To ensure children have no previous knowledge of the spelling rules in our experiments, we use "alien" (made-up) words which follow their own spelling rules (which we also make up!). We show the children some of these words (text exposure), and then test them to see if they know how to spell new alien words. Some children are also taught the alien spelling rule explicitly at the beginning of the experiment. We have found that more simple rules can be picked up simply by reading the words (e.g., "*u*" is always followed by double letters (e.g., mu*ff*, mu*ll*) whereas "*e*" is always followed by single letters (e.g., me*f*, me*l*)) but more complex rules (e.g. "*u*" is always followed by a double *ff,* but a single *l*) were only learned with direct teaching. This was the case even if we gave children the opportunity to "search" for the rule themselves: they needed to be taught it directly.

One caveat with this work is that we only test children *directly* after learning. An important follow up is whether *long term* retention is better after text exposure. We will be looking at that next year.

Another set of new experiments will use a whole new alien orthography! This helps us to ensure that children's previous knowledge of English spelling doesn't interfere with their ability to learn our alien spelling rules. So far, we have shown that children can learn simple patterns in this orthography– for example, just as *ck* can end but not begin an English word, they can learn that the letter  can begin but not end a word "  ". We are now looking at whether they can learn more complicated patterns in this language.

We hope that in the long term, this work will have implications for teaching spelling in the classroom.