Early second language learning? Yes, but we can do better

Diana Pili-Moss *discusses how a better understanding of children's cognitive abilities could improve second language learning in the early years*

It is widely believed that young children are particularly good language learners. They are often compared to 'sponges' for their ability to easily pick up on and use new sounds and structures when they are exposed to a new language. One of the primary sources of evidence supporting these claims comes from observing how young children acquire their first (native) language. In conditions of adequate social and communicative interaction, children on average start to utter their first words between 9 and 18 months, go through an astonishingly rapid development in vocabulary, phonology and syntax, and reach nearly full syntactic competence in their native language by the time they are five years-old.

Young children have also been found to be very effective learners of second (or additional) languages, particularly in studies considering 'ultimate attainment'. Ultimate attainment is defined as the highest level of proficiency that a speaker of a second language can reach after ten or more years of continuous exposure in an environment where the language is widely used for communicative purposes (naturalistic exposure conditions).

Studies have found that there is an inverse relationship between the age at which the immersion in the second language environment starts on the one hand, and how 'native-like' second language learners will ultimately be able to perform on the other hand. In other words, the earlier that language immersion begins, the more native-like second language learners' performance will be later in life. For example, there is evidence that, on average, native speakers of a given language will very likely *not* be able to detect a second language speaker by their language performance if he/she started immersion by age 3. If the onset of immersion occurs *after* age 3, then the later that immersion begins, the more likely it is that native speakers will spot differences relating to phonetic/phonological competence, fluency, morphology and syntax. Of course, particularly gifted individuals who start learning a language later in life may be able to attain levels of performance

that are native-like, but these seem to be rare exceptions rather than the norm.

Although research indicates that there is an advantage in starting exposure to a second language as early as possible, we also know that the maxim that 'children are better than adults at learning languages' does not automatically hold in all learning situations. For example, it may not apply when second language learning occurs mainly in the classroom. In this case, contrary to what one might expect, adolescents and adults learn more speedily than younger children, and consistently reach higher levels of attainment. So, to what extent can we claim that starting earlier is better in second language learning? We can seek a possible solution to this conundrum by considering the environmental conditions in which second language learning occurs in naturalistic vs. instructed contexts (the classroom) and how these interact with the learners' age and cognitive characteristics.

The first thing to observe is that, similar to what happens in first language acquisition, successful early second language learning seems to depend to a great extent on the quality and quantity of the input to which young learners are exposed. In particular, marked advantages in early second language learning appear when children are consistently exposed to rich and varied input, a condition that can be met in immersion contexts or in learning situations that closely resemble immersion. By contrast, early learning advantages tend to disappear in environments where language exposure is more limited both qualitatively and quantitatively, as in the case of the traditional language classroom.

Researchers have long been interested in understanding the effects of input in second language learning and how rich input may benefit learners in general, and younger learners in particular. For example, research on language input has shown that very young children are surprisingly good at a particular skill that is fundamental for language learning - the ability to extract regular patterns from continuous sound streams. In a series of seminal 1990s studies conducted in the US, psychologists showed that infants as young as 8-months are able to identify and distinguish words from non-words in a continuous stream of aural input.

In this type of experiment, the researcher exposes the infants to a continuous stream of syllables (e.g. *ba*, *bu*, *ga*, *gu*) for a few minutes, then tests the extent to which the children react to recordings of individual words and non-words by turning their heads towards the sound source (the assumption is that they would attend longer to new/unfamiliar sounds). These studies demonstrated that infants can recognise words by tracking the statistical probabilities that a given syllable is followed by another. To simplify matters somewhat, in our example the infants would recognise that *ba-bu* (unlike, say, *ba-ga*) was an independent linguistic unit (a word) by keeping track of the probability that *ba* was followed by *bu* and finding that it was critically higher than the probability that *ba* was followed by *ga*. Of course, on-line statistical computations of this kind are not conscious processes in young children; rather, they are implicitly and automatically performed cognitive operations triggered by virtue of exposure to a sufficiently informative flow of input. We refer to this type of learning as statistical/procedural learning.

Further studies have shown that statistical/procedural learning continues to have an important role in the acquisition of first and second languages in older children and that there are differences in the cognitive abilities that children and adults employ in language learning. For example, a recent study conducted at Lancaster University compared 8-9 year-old children to adults based on their ability to learn the syntax of a new language implicitly (without rule explanation). In children, aural learning was positively related to the ability to learn abstract sequences from exposure to visual input. By contrast, language learning in adults was significantly related to explicit memory skills and more complex cognitive strategies such as hypothesis-testing and inference.

Independent neuropsychological evidence suggests that the reliance on statistical learning in younger children vs. the use of explicit learning strategies in adults may be rooted in more general differences in cognitive development. Since higher cognitive abilities that underpin explicit learning strategies undergo substantial development from late childhood (after 10 years of age), younger children may rely on them to a lesser extent in comparison to older children and adults.

In sum, two main routes to learning a second language are available to learners, depending on environmental conditions (availability of sufficient amounts of quality input) and the characteristics of the learner (age). One strategy, the statistical/procedural route, is applied unconsciously, works best when sufficient exposure to the new language is available, and is probably the learning route that infants and younger children mainly resort to when faced with the task of acquiring a new language. The second strategy relies more on the conscious/explicit detection of rules and patterns, i.e. on 'understanding' how the language works, and is increasingly available to older learners as a function of their cognitive development.

Approaching language learning explicitly - considering language as an object to be 'understood' - has certain advantages that make it particularly effective in the traditional language classroom. For example, explicit instruction speeds up learning in the short term by providing abstract rules that can be applied in order to analyse language. Further, explicit learning does not depend on the availability of extensive input - a few examples and an explanation of how a certain rule works may be sufficient.

However, explicit instruction is often unstable in the longer term. Knowledge that is acquired in a way that relies on memorisation can be easily forgotten, particularly if there has been little opportunity for practice or repeated rehearsal. Another common problem is that understanding a rule does not necessarily translate into expert use of that information in proficient performance. For example, one may be shown and perfectly understand that, in German, verbs are placed *after* their complements in subordinate clauses, but being able to fluently produce utterances with the correct word order in a communicative situation is an entirely different matter.

Explicit strategies may also be very effective for learning aspects of a new language that can be easily described. However, they may be less effective for rules that are more complex or difficult to describe (consider trying to explicitly instruct a learner on how to produce sounds that do not belong to the inventory of his or her native language). On the other hand, although language learning via the statistical/procedural learning route occurs over longer time spans, it has the advantage of resulting in language

knowledge that is more stable in the long term and ultimately more native-like across a wide range of linguistic abilities.

The fact that younger language learners may be particularly reliant on language learning strategies that are *not* optimally efficient in traditional classroom settings raises important pedagogical questions regarding language instruction provision and the curriculum, particularly in the pre-school and early primary years. A rather simplistic view would take the results of classroom studies to indicate that, since rate of learning is comparatively low in the early years, one may as well introduce language learning later in the curriculum, when children are older and become more adult-like in the way they approach learning in general and language learning in particular. However, by doing so we would miss out on the opportunity to tap into the potential that children have for learning second languages by employing robust strategies that may resemble first language acquisition in important ways.

I would rather suggest that the results of classroom research point to the need for a profound rethink of how second languages are taught in the early years. In this respect, a crucial challenge for researchers, instruction designers and practitioners will be to devise efficient ways in which the specific language learning potential of young learners can be harnessed. A central issue for language instruction in the early years is how to provide more opportunities for access to sufficient amounts of second language input, given the limited time that is allocated to foreign language learning in children's busy school schedules. Further opportunities to provide input and contact with the language may be envisaged outside the classroom: particularly promising ways of achieving this could include planned and consistent exposure to age-appropriate foreign language media and computer-based games, a medium that many younger children are familiar with and enjoy using. Further, systematically extending language learning beyond the language classroom will necessarily require the support of family members and carers and a shared awareness and understanding of the cognitive and social role of language learning in the child's education.

Given what we know about the developmental differences in their cognitive abilities, it would be surprising to find that younger learners and

adults attain comparable levels of proficiency in second language learning in conditions of poor language input. As we understand more about how younger learners acquire second languages, our focus as researchers and educators should be on maximising their learning potential by designing and implementing tailored teaching and learning strategies that recognise and value their cognitive abilities.

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Find out more

Articles

Statistical learning by 8-month-old infants by Jenny Saffran, Richard Aslin and Elissa Newport (in *Science*, *274*, pages 1926-8, 1996). You can also find a video explaining how Saffran et al.'s study was conducted on the Youtube channel *Ok Science*: https://www.youtube.com/watch?v=GW5fVH6iV2s

Books

Second Language Learning in the Early School Years: Trends and Contexts, by Victoria Murphy (Oxford University Press, 2014).

Online

The earliest stages of second language learning: A behavioral investigation of long-term memory and age, by Diana Pili-Moss (Lancaster University, 2018; https://psyarxiv.com/7p5f2/).
