

Talking with Martti Martens 1: Learning to read and supporting children with the reading process.

Michael Jones met up with Martti Martens, co-developer of Lexion, in April 2007, to discuss Martti's views on reading, and how Lexion supports learning for children who are struggling with the reading and writing process. In this first part of the discussion we look at what is involved when children learn to read, as a foundation for understanding how problems can arise, and Lexion's place in supporting children and adults with reading and spelling difficulties.

MJ What's your professional background Martti, and how did Lexion come into being?

MM I was working as a Speech and Language Therapist in Sweden, with children with language-related learning difficulties and dyslexia. I was very concerned about the 20% of children for whom learning to read can be a very confusing and laborious process. By studying how most children effortlessly learn to read and write, I began to design programmes and approaches that focused on the key factors in reading development: phonological awareness and phonological processing. Another Speech and Language Therapist, Olof Gunnilstam, had devised computer software for adults recovering from aphasia, and I could see its potential for children with dyslexia and other reading and writing difficulties. So between us we created Lexion, which is now used in 80% of Swedish schools.

In 2003 we met two members of the British Dyslexia Association's ICT Committee, and they encouraged us to translate the program into English, and adapt it for use in English schools. The extensive standardisation process is now complete, and Lexion was launched in the UK at the NASEN exhibition in 2005.

MJ Tell me about the 80% of children who find reading relatively effortless. What's the process they go through?

MM Before they start school, most children have absorbed an enormous amount of information about language and reading, and a wide range of skills that they need as the foundation for fluent reading and writing. These skills develop as soon as they start to learn to speak, and come about naturally through interacting with parents. This is especially true where parents are confident readers, and where children are encouraged to share books. Playing with language is also vital for developing the key skills for reading: phonological awareness and processing.

MJ Can we take a closer look at phonological awareness?

MM As soon as a child starts to speak, he is showing some awareness of how words should be pronounced as speech sounds in a word. This is one aspect of phonological awareness. As he grows he starts to play with words, encouraged by his parents. When adults accidentally, or on purpose, mispronounce words, and the child says, "No Daddy you must say 'shoe', not

‘soo!’” he is already showing a high degree of phonological awareness. He recognises that there are such elements as ‘words’, and that words are made up of sounds. He also starts to understand that sounds are arranged in certain ways to create words, and that these words are meant to express meaning. Of course he might not have the language to express these ideas (after all he’s only three!) but he is showing that he has the awareness of how we use sounds in our language. This is one aspect of *phonological awareness*, and without this the child might experience difficulties in becoming a fluent reader. But he still might be showing that he has good vocabulary development, which is vital for reading.

MJ Is rhyming important?

MM The ability to recognise that two words rhyme is another of the key features of phonological awareness. It’s a complex skill, but most young children seem to do it effortlessly. When a four year old girl says, “Listen Mummy, ‘bar’ and ‘car’ sound the same” she is showing that she can hear the difference and similarities between two words, based on her ability to segment the words into sounds. Furthermore, she is beginning to talk about language in an abstract way, showing that her ‘phonological thinking’ is developing. These are incredibly complex processes, and an amazing feat for such a young child. As teachers we spend many years developing this awareness and these skills in older children for whom this process does not come naturally, and who are struggling as readers in school.

MJ And Lexia helps children with this process....

MM Absolutely, but there’s more to the reading and spelling process than phonological awareness, and we need to look at this now. The first stage of learning to read is when children take an interest in words as images. So for example they quickly recognise the logos of shops like TESCO and McDonald’s. This is the *logographic* stage. Then through the development of phonological decoding, they start to remember words as whole shapes, and this is the *orthographic* stage. These are important skills, and fluent readers use orthographic methods all the time. These skills can take many years to establish for some children but can be effortless for most of children. However we need more than these skills to become competent and confident readers and spellers.

MJ So are reading and spelling the same process?

MM I prefer to think of reading and spelling as two sides of the same coin. To read, you need to be able to *decode* words – break them down into individual sounds, or *phonemes*, and then try and make sense of them from your vocabulary, or *lexicon*. In spelling we *encode* words: we build them using the individual phonemes as building blocks to make up words. Children with reading and spelling difficulties can have problems in one, some or all of these areas. A typical problem is where children have learned some of the basic skills of the reading process, but cannot make sense of the whole

process to use it effectively. A perfect example of this was a seven-year-old boy in Sweden, who had been judged by his teacher to be a 'good reader'.

When I assessed him using Lexion, we discovered that his phonological awareness and skills were in fact very poor. What had happened was that he had memorized words by their shapes, logographically, but was unable to decode words that were unfamiliar. His spelling also turned out to be poor, as he could only spell words that he had memorised. He needed a lot of support with listening and developing phonological awareness to ensure that he understood how to use the skills to be able to read.

MJ So it's possible for children to have isolated skills and, therefore, have underlying reading problems. I could see how teachers could miss this.

MM That's right. Children want to learn to read, and they realise it is important; so they use whatever skills they have to make sense of the reading process. If one way, say decoding words by listening to the individual sounds, doesn't work because they have weak phonological awareness, then they will use another skill: in this case relying on visual memory. He was a bright boy with a very large oral vocabulary and he was a completely logographic reader, and not using any phonological clues at all. It is essential that children understand all of the processes of reading so that they can 'see the whole picture', and are able to use the different skills, including orthographic reading. Without this total understanding of the concept of reading, and especially phonological awareness, they cannot become fluent and confident readers.

MJ But a fluent reader reads words from memory and recognises them as a whole.

MM That's true, but the only way to get to this position is through phonological reading in the first place. When you are a 'whole-word', orthographic reader, you can use, whenever you need to, your knowledge of speech sounds and how these are used in words to make individual sounds (*phonemes*), syllables, and whole words (*morphemes*). In other words you can use your phonological skills. You do it instantly, but it may have taken you some time at school, and lots of practice at home, to get to this point.

Let me give you an example to show how the process works, and then we can have an idea of what can go wrong, and how using Lexion can help. When a child begins to read the word 'lamp', first of all he will begin to break it down into the phonemes 'l-a-m-p'. As long as he has this word in his vocabulary, he will be able to read the word. But after, let's say 15 times, he doesn't need to 'sound out' or decode the word. He can now recognise it orthographically, as a whole word. He has elevated the word to become part of his whole word reading, through practice. But when he comes to a new word, like 'lampshade' he will have to break down the word again and go through the whole process. But by the time he gets to the 'l-a-m-p-sh..' he may have made an accurate assumption of what the word is. The process is slow at first because of its complexity but advances rapidly if the child has good phonological skills as a foundation. As fluent readers we do this all the time, automatically.

Most children enjoy doing this: it's a challenge for them, but an enjoyable challenge. So you become an automatic reader, and you don't have to read all of the words in the text. You start to 'read between the lines' and are free to think about the context, about the meaning of the words, what the story is about and all of the other aspects of reading that we learn about in school, and come to enjoy. But for around 20% of children they need to have some type of intervention that will help them move through these stages.

MJ Before we come onto the 20% can we spend some time looking at memory, and how this is involved with the reading process?

MM We don't consider ourselves to be experts on memory skills but nevertheless we have devised tests and constructed training programs for auditory as well as visual memory skills. We make a distinction between *short-term memory* and *working memory*. Activities involving short-term memory need an instant response. So if I ask you to repeat the number string 3674521, you will be using your short-term memory. But if I say to you, "which word is longest: 'banana' or 'horse'?" You will need to 'elaborate' on this information: you will need to do some work on it by using your phonological knowledge of the words, remembering and comparing. This is using your working memory. This type of exercise, which appears in Lexion, has enormous potential for phonological working. The better the child's skill, the less he will have to use working memory, and the easier the reading process becomes: and more enjoyable. The more you have to use your working memory when reading, the harder you have to work, then there is a higher risk of you losing attention. So readers need to practice underlying phonological skills so they become automatic. This is where Lexion can help.

Talking with Martti Martens 2: How problems arise with reading and spelling, and how Lexion helps.

Michael Jones met up with Martti Martens, co-developer of Lexion, in April 2007, to discuss Martti's views on reading, and how Lexion supports learning for children who are struggling with the reading and writing process. In this second part of the discussion we look at how problems can arise, and Lexion's place in supporting children and adults with reading and spelling difficulties.

MJ Let's talk about children with reading and spelling difficulties now: the 20% you mentioned earlier. How do problems arise?

MM One of the major stumbling blocks for children in the UK and Sweden is that our languages have very complex spelling patterns. They are known as having a rather *deep orthographic transparency*. Then there are languages with a rather *shallow orthographic transparency*, like Finnish, Italian and Spanish, where the letter/sound correspondence is considered to be quite regular. A friend of mine who is a researcher in Finland even suggests that Finnish children generally don't need specific training in phonological skills at all due to the regularities in their language. With 'deep' languages, however, we need to spend a lot of time on training children's phonological skills because many of our written words bear little resemblance to how they are spoken. A typical example is the word 'cough'. This could be written in so many different ways, but the standard spelling is quite bizarre, if you look at it closely, and especially when you try to spell words that rhyme with 'cough', like 'off'. It's very confusing. Children, and anyone learning English as an additional language, just have to learn that this is how it is spelt. It makes the reading and spelling process a challenge. However languages like Spanish, Somali, Czech and Finnish are so much easier to learn to spell and pronounce, because they are more 'shallow', and in general the sounds we speak, the *phonemes*, only have one letter assigned to them in writing. So from the beginning they are easier to read and spell.

MJ This must make life difficult for Swedish and English teachers as well.

MM Very much so. Children start school with varying degrees of understanding of what reading is about. Some will have specific problems, e.g. dyslexia, or a history of earlier speech difficulties or hearing loss. When a teacher works with a whole class, she needs to work with all children from the same starting point, and with the same approach. This means that she might make assumptions about children's knowledge that are incorrect.

Because children want to please their teacher, and be seen as 'good learners', they try to make sense of reading as quickly as they can. Many children become very confused, or learn parts of the process without understanding the whole. Here's an example. A teacher says to a 5 year old, "What does the word 'bird' begin with?" The little boy thinks and answers, "I know: 'beak'. And it ends with 'tail'!" We can see that this child has no concept of what 'sound' means in the context of reading, or the concept of 'word'. He

will need a lot of individual support to bring him to this important point of understanding, even before we can think about introducing him to reading and thinking about letters and their sounds.

MJ But there will be children in the class who have all these concepts, and are ready to work on the formal aspects of reading.

MM That's true, and I recognise that teachers have a very tough job, and particularly in identifying children who will need more support. But it is still vital that we begin with all children developing basic listening skills and making sure that everyone understands the concepts. I'm going to stress this, because this is how problems of late identification of reading difficulties can be avoided.

I know children in the first two years of schooling who have poor phonological skills, perhaps because they had a hearing loss when they were younger. They are trying to learn to read, but can't make sense of the way that speech sounds correspond to letters. So their brains tell them, "This is not making sense! Use some of your other skills!" This is likely to be their visual skills, so they will learn words as whole images, *logographically*, or memorise whole words using various clues, like the first letter or the whole word, *orthographically*.

Often children will use a mix of visual strategies, creating hybrids of images and letter- sound correspondence and letter names. They have to use a lot of working memory, and can become quite exhausted and de-motivated. But crucially they will seem to be 'good readers', because, at least in the early stages of learning to read, they are able to convince their teachers that they understand what reading is about. Only later, when the demands of reading increase, will we become aware that there are problems. Valuable time is lost, and children's confidence suffers.

Children may also show that they have learned the *phonemes* mechanically but still don't understand the important concept that spoken words consist of speech sounds.

MJ And I imagine it will be difficult for teachers to spot these children early on.

MM Yes, but Lexion can help here. The program can assess phonological and other skills and show what stage they are at. Can they segment compound words, for example, like "letter" and "box" to make "letterbox"? Assessment tasks like these have been carefully designed to tap into understanding and skills that are fundamental for reading. If they are not at this stage, then Lexion will automatically give them exercises at their level of understanding, and will move them towards this stage.

MJ And the teacher can use this in class?

MM Teachers can assess all the children, and work out what strategies they are using, and most importantly, see which children need support, and give them exercises to help them. Or the school's Special Needs Coordinator can

assess children individually and support the teacher to deliver the program. Teaching Assistants have an important part to play too.

MJ Presumably young children, and those with quite severe reading problems like dyslexia, will need to do a lot of work before they are ready to use programs like Lexion.

MM Yes and no. Assessing children with Lexion stimulates teachers to come up with strategies that they already have to support children. Lexion points them in the right direction, so teachers, Teaching Assistants and parents can say, "This is the problem, we can use parts of Lexion, but equally we can use our own ideas." We are helping the teacher choose the right path and guiding him along it. He will be using activities like segmenting words with the whole class, but Lexion is confirming that certain children will need a lot more work on this area before they can move on. There are many activities that we can use to develop children's listening skills: focusing on listening in general, and then on speech sounds and letter-sound correspondence.

MJ But I have known classes where as many as 10 children need reading support, and all with different skills and at different levels. What can Lexion do in this type of situation?

MM Each child can have their own adapted version of the program, that is tailored for their individual needs. After their assessment, one click of a button gives the teacher a report on a reader's strengths and weaknesses, and recommends approaches. Another click on a button will automatically give the child access to exercises that are exactly right for him, with exactly the right amount of challenge. There is also the possibility to use activities with a group, perhaps using the interactive whiteboard, which are beneficial for several children. The dynamics of a group session in training phonological skills can be very important, as children learn from each other, and may be more motivated to meet challenges.

The program automatically logs the child's progress, and adjusts the amount of challenge, so that he remains stimulated and motivated. It also measures when he has achieved enough success and can move on to other exercises.

MJ But Lexion has the capacity to generate thousands of exercises. Does this mean children have to work their way through each one?

MM Not at all. I'll tell you something quite fascinating, and reassuring. In my experience, often when you come to retest children, you will find significant improvements. If we spend time on the fundamental skills for reading, and particularly phonological awareness exercises and listening, there is often progress in other areas- where we have either done relatively little work, and sometimes no work at all.

MJ How is that possible?

MM What seems to be happening is that by focussing on phonological awareness: working on speech sounds and letter sounds and how they

correspond to each other, the children are developing and fine-tuning the skills that they need for other areas of the reading process. But most importantly, not only are they developing the skills, reading is starting to make sense, because they are now developing phonological *awareness* and *skills*. They also begin to understand that the way words are spoken corresponds to how words are written. They are starting to get the whole picture. There are other benefits too, because Lexion is also developing their vocabulary. And most importantly, the children are achieving success and becoming motivated as readers. Spelling also improves, as the children are putting in a lot of time looking at words, moving letters and words around the screen, and generally practicing their skills.

MJ That is very reassuring, and exciting too. But I suspect we have just scratched the surface here. At a later stage we can look at the theoretical basis of Lexion, the challenges that teachers face, and some more solutions.

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