

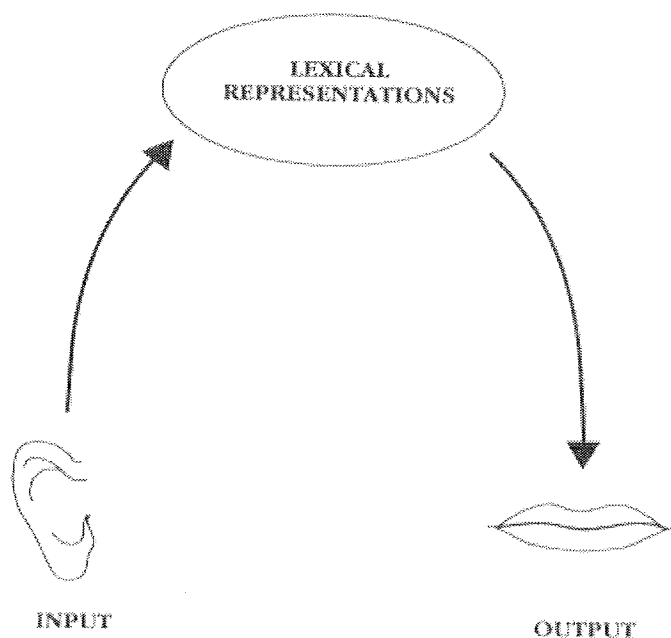
Children with Apraxia and Reading, Writing, and Spelling Difficulties

by Joy Stackhouse, Ph.D.

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It is not the case that all children with a history of speech and language difficulties have associated literacy problems. However, school-age children whose speech difficulties persist beyond 5 years of age are most at risk for associated difficulties in reading, spelling and sometimes maths. Let us first consider the nature of persisting speech difficulties with reference to a simple psycholinguistic model of speech processing.



This illustrates that we receive spoken information through the ear (input). The information is then processed as it goes up the left hand side of the model and is stored at the top in a word store (lexical representations). When we want to speak we can access stored information and programme it for speaking on the right hand side of the model (output). Some children with speech difficulties have difficulties with speech input (e.g. differentiating between similar sounding words); others have imprecise or 'fuzzy' storage of words which makes it difficult to access them (as in word finding difficulties) or to programme a clear production of them because of missing elements in the word store; while others have a difficulty pronouncing

speech at an articulatory output level (on the right hand side of the model) even though they know the words involved perfectly well. Children with persisting difficulties, however, may well have pervasive problems which involve all of these aspects of speech processing: input, representations and output. Where this is the case they may also have language difficulties (comprehension and/or _expression).

The speech processing system, as illustrated above, is not only the basis for speech and language development but also the foundation for literacy development; 'written language' being an extension of 'spoken language'. For example, if a child has delayed understanding of spoken language s/he will find it very hard to access meaning from the printed word even though s/he may be able to decode the letters perfectly well. Sometimes, children with comprehension or 'semantic-pragmatic' difficulties are described as 'hyperlexic'; this term indicates that a child can read print mechanically better than they can understand it. Other

children, particularly those with persisting speech difficulties, have a problem with the mechanics of reading and are more likely to be described as 'dyslexic' or as having 'specific' reading and spelling problems. This suggests a problem at one or more levels in the speech processing system depicted above.

Typically developing children use this speech processing system not only to develop speech but also use their speech skills to develop another skill: 'phonological awareness'. This is 'an ability to reflect on and manipulate the structure of an utterance as distinct from its meaning'. You use your phonological awareness skills to play sound and rhyme games, e.g. judging if two spoken words begin with the same sound or not (e.g. CAT CAR; CAT BALL); or producing a string of words which rhyme with e.g. CAT. Children who find such games difficult, compared to their peers, often have problems with cracking the alphabetic code of languages such as English. Cracking the code is what children do when they sound out letters of a written word and then blend them together to read/pronounce it, or when spelling they take a word, break it up into it into its bits and put letters to each sound segment. Cracking the code therefore involves not just knowing about letters and sounds but also recognising the sequence of sounds in a word, e.g. what is at the beginning, middle and end. This phonological awareness is helped by being able to repeat words consistently and accurately to allow reflection on the structure of the word. Thus, children with persisting speech difficulties often need specific help not only with learning letter sounds and names but also with how these are combined in words through graded phonological awareness activities.

Clear and consistent speech production is particularly important for spelling or when learning new vocabulary. Typically, when asked how many syllables there are in a word (another phonological awareness skill), children repeat it, segment it out loud or in a whisper and then count the beats on their fingers. If they are not able to produce the right number of syllables in the word or if they cannot say the word in the same way on more than one occasion then they cannot spell it correctly or store it clearly. When trying to spell a long word, Danny, a 12 year old boy with apraxia of speech and dyslexic difficulties said exasperatedly: "If I can't say it I can't split it up!"

This is a really important insight and true of many children with speech difficulties. Michael, for example, had dyspraxia of speech with inconsistent production of multisyllabic words and particular difficulties producing clusters/blends (e.g. 'br' in BRUSH, 'fl' in FLOWER, 'spr' in SPRAY). His IQ was within normal limits but he had specific reading and spelling difficulties. When trying to spell a long word at 11 years of age he attempted to segment it into its sounds but then transcribed each of his many attempts. The result was rather dramatic. He spelt UMBRELLA as 'rberherrelrarlsrllles', and CIGARETTE as 'satersatarhaelerar'. In his spelling of UMBRELLA he has dropped the first unstressed syllable ('um') from his spelling and is trying to write the first stressed syllable 'br' which he cannot pronounce. This takes up at least half of the spelling attempt. He is, however, aware that the word includes more than one letter 'l'! When spelling CIGARETTE he wrote down the beginning sound ('sa') and end sound ('ter') of the word twice before losing it completely (haelerar). Combining work on all aspects of his speech processing system with phonological awareness and letter knowledge training helped him to have a more consistent approach to his spelling.

Spelling can also be a persisting problem for children who appear to have resolved their speech difficulties. In a recent study we compared the performance of a group of 7 year old children with speech difficulties with a matched control group of their peers (who did not have speech difficulties) on National (UK) tests of reading, spelling and maths. We then compared performance on the same tests of children with persisting speech difficulties with those children who had resolved their speech difficulties. More children with speech difficulties scored below average performance on the tests than did their IQ matched controls,

particularly in spelling and reading comprehension. The children who had resolved their speech difficulties performed significantly better than the children who had persisting speech difficulties on all tests and did as well as the controls on everything except spelling.

In summary, children's speech difficulties arise from problems at one or more points in their underlying speech processing system. This system is the foundation for their written language as well as their spoken language skills. If this foundation is unstable, additional support will be needed to enable a child to use the strengths s/he has to develop phonological awareness skill and letter knowledge. This is tough but not unsurmountable. Once at school, children with delayed spoken and written language can benefit from intensive and explicit letter-sound linkage work coupled where necessary with targeted speech and language work. Add supportive home and school environments and the active involvement of the child in his or her own intervention programme to this and progress will follow. When Danny was asked at 14 years of age what advice he would give to others, he stated:

"If you have any problems to see a therapist, to always try and write letters. Enjoy it. Do not take it as thing you never get out of it 'cause if you try you will."

[Professor Joy Stackhouse is a registered speech and language therapist, chartered psychologist and teacher of children with specific literacy difficulties. She currently has the Chair in Human Communication Sciences in the Department of Human Communication Sciences at the University of Sheffield, UK. Prior to this she was Professor of Speech and Literacy at University College London. Joy's research and practice focuses on children with persisting speech difficulties and their associated literacy and psychosocial development. She has co-authored books and papers in this area particularly with Professor Maggie Snowling, Professor Bill Wells and is currently writing a book on persisting speech difficulties with Dr Michelle Pascoe.]

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