Phonological awareness and deaf children

Lorna Gravenstede has been studying how closely the phonological awareness of deaf children affects their reading abilities

Phonological awareness (PA) and its relationship to the development of literacy skills have received a great deal of research attention over the last thirty years and yet there are still many unanswered questions with regards to the nature of this relationship and the relative importance of different aspects of PA for deaf children learning to read and spell. PA refers to the ability of an individual to reflect upon and manipulate the sound structure of spoken words. There are different levels: the syllable, onset-rime and phoneme, which are often defined as following a developmental pattern. There are several different types of task that can be used to assess phonological awareness at each of these levels and these include tasks of recognition (e.g. how many syllables in 'banana'?), generation (e.g. which words rhyme with 'cat'?) and manipulation (e.g. say key, but don't say 'k').

It has long been known that in hearing children PA skills are correlated with reading ability, predictive of later literacy skills and impaired in subjects with significant literacy difficulties. However, in a detailed literature review, Castles and Coltheart (2004) came to the conclusion that there is in fact no unequivocal evidence of a causal link from competence in PA to success in reading. Some researchers have posited that the relationship between PA and literacy skills is reciprocal, so learning to read may actually lead to improved PA skills as well as vice versa. In a more recent meta-analytic review of the literature Melby-Lervag et al (2012) found evidence in longitudinal and training studies that there 'may be' a causal relationship between phonemic awareness and word reading in hearing children, but they did not find such a relationship between rime awareness and word reading.

Clearly, deaf children are a heterogenous group and so it is probably no surprise to find that the many studies into the PA skills of this group and how these appear to impact upon the development of literacy skills have yielded differing results. There are, of course, many studies that do find correlations between various PA tasks and literacy skills for groups of deaf children (e.g. Johnson & Goswami 2010). Interestingly, when studying students at Mary Hare School (an oral specialist school), I found a group of pupils in years 7-9, who had real and non-word reading skills within the normal range for children of their age, good grapheme-phoneme knowledge, but relatively poorly developed PA skills. These students were all congenitally severely or profoundly deaf individuals who were hearing aid users. Somehow these students had all become good readers, in spite of weak PA skills, which should not be possible if PA is **necessary** in order for reading to develop. A very recent review paper by Miller and Clark (2011) draws a similar conclusion, that many pre-lingually deaf children develop word reading at comparable levels to their hearing peers in spite of remarkably poor phonemic awareness. The authors conclude that these children are able to use orthographic knowledge in conjunction with syntactic awareness and metacognitive skills in order to boost their word reading and comprehension of written texts. In a longitudinal study of reading development in deaf children over a three year period Kyle and Harris (2010) found that earlier reading was related to later phonological awareness skills, suggesting that at least some deaf children might develop their PA through reading.

So, given the mixed findings in the research, what does this mean for our practice with deaf children as they learn to read? It is clearly important that, as happens anyway, everything is done to promote the best possible development of all of the skills that have been found to be related to literacy in this population. This includes all aspects of language development and speech reading. Given that some researchers are still reporting an important role of a least some aspects of PA for the development of literacy skills, we cannot ignore this area, but we do need to be aware that for some children, fluent reading will develop as a result of other strategies which in turn will ultimately facilitate PA skills. Deaf children are all very different and each case needs careful individual consideration.

For young children, we need to know their PA skills levels and put programmes/activities into place to boost these skills if they are not developing in line with other skills. Ultimately, the types of activities that are carried out in PA training programmes are also useful in terms of development of listening and speech as well as any possible impact on later literacy skills. These are activities that Teachers of the Deaf have always encouraged carers of young deaf children to carry out (e.g. singing nursery rhymes, clapping syllables etc.).

Deaf children who do not have good access to speech are those who are at the greatest risk of having poorly developed PA skills. Various strategies are already routinely used with this group of children in order to make the sound pattern of spoken language accessible in a visual form. These include visual phonics and cued speech. Studies carried out on children who learn cued speech from an early age show that as a group these

children do develop phonological awareness skills comparable to their hearing peers (Charlier & Leybaert 2000). There is relatively little published research on the effectiveness of visual phonics. In one study by Narr (2008), this system was also found to improve children's use of phonological information and ability to make rhyme judgements, but no relationship was found between the subject's reading ability and the length of time they had been exposed to visual phonics. I am hoping to learn more about the effectiveness of these two forms of instruction in this edition of the BATOD magazine!

For older deaf children who are experiencing particular difficulties with their literacy skills, PA is one area that should be explored, along with all of the other many skills that are known to underpin the development of literacy. I have worked with deaf children in the past who, in spite of good speech perception, speech production and language skills, persist in finding learning to read and write very difficult. In other words, deaf children who are very clearly presenting with specific difficulties with literacy skills. My experience is that these children also tend to have weak PA skills and that training on PA skills does sometimes appear to have a positive impact on their literacy skills. It is, of course, difficult to unpick whether it was PA training or another aspect of the literacy instruction they received that made the difference for them. We really need studies on children such as these, where the impact of a PA training programme on the development of PA skills and on reading and spelling is carefully measured and written up for publication. Such studies need to try and tease out whether input needs to occur at all levels of PA (syllable, rime, phoneme) or whether concentrating on particular aspects of PA (phoneme awareness looks to be the most likely candidate) is sufficient to bring about improvement in reading and spelling. To date, I can only find one published study, Palmer (2000), that looks at PA training in deaf children. In the two cases reported in this study, the children received PA and grapheme-phoneme training and an improvement in both children's PA and reading skills were observed after the intervention. We also need more studies on how PA skills develop in as many deaf children as possible over time. So, I would encourage anyone working with this population of children who has the time and resources, to get researching and add to our knowledge base so that it becomes easier to be sure about exactly which skills should be trained, when and how!

Lorna is a specialist speech and language therapist and works for The Burwood Centre and Mary Hare Training services. Her interest in phonological awareness (PA) began as an undergraduate and her dissertation was on the relationship between PA and literacy in young hearing adults. Lorna has since carried out research into the relationship between PA and literacy in deaf children.

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