Using Cued Speech to support language development in deaf children

Cate Calder explains how the combination of lip reading plus the manual 'cues' of Cued Speech can give valuable extra language information to a young deaf child

We know that typical language development is nurtured in the context of a baby's social interactions with their primary caregivers. The importance of a reciprocal dialogue of eye gaze, facial expression, gestures and vocalisations (more often triggered by the baby's signals to the mother) is key to building that important feedback loop which serves to expose the child to the increasingly complex linguistic features of their mother tongue. Within the first year of life, native language competencies are stimulated, embedded and are already reaching advanced stages of development, any disruption to this process may have far-reaching implications for future social and cognitive development. We are all well aware of the particular challenges faced by a deaf child highlighted by this quotation[1]:

"The language outcomes of hearing children are robustly predicted by their experiences and acquired competencies during the first year; yet these predictive links are absent among prelingually deaf infants *lacking a language model*." Levine et al (2016).

While hearing parents will be dealing with the emotional impact of discovering their child is deaf with all the implications this may have on their own well-being, vattachment and sense of competence as parents, their baby's main challenge is actually quite simple – speech *perception*. How can a child without access to the acoustic element of speech, pre-cochlear implants and radio aids, acquire the language conveyed through those speech sounds? Those of us who use Cued Speech feel we have an answer firmly in our hands.

If the hearing parents of a deaf baby are able to establish and preserve everything they would do naturally with any child ie hold the eye gaze and dialogue with their baby through the mirroring of emphasised facial expressions, gestures and 'sing song' style vocalisations during every day meaningful interactions, they could simply replace the missing acoustic information for their child by cueing it. The impact of manually repairing this missing link in the deaf child's early experience of the home language could place that child back on an equal footing linguistically with their hearing siblings.

A cueing parent of a deaf boy writes: "When I started to use CS with my baby it was wonderful to be able to cue whatever I wanted to say and know that it was TOTALLY clear. Like any baby, he didn't understand it to start with but quite soon he began to make the association between the cued words (with the addition of the few sounds he could hear) and names, objects and ideas – just as a hearing baby would. He learned language at the same pace as his hearing friends and when he started school his language was about the same as the hearing children and his school work showed he was thinking in full English."

Cued Speech is the name of a simple manual system comprising eight handshapes and four positions around the face which are used by a speaker to enable a deaf child (or adult) to visually perceive their speech. The combined impact of seeing the visual manual 'cues' synchronised with the visual articulatory information in natural lip-patterns gives the receiver a discrete consistent picture of the phonemic structure of every spoken word in real time regardless of how much or how little of the acoustic signal they can access.

Cued Speech is used purely to serve the lip-reader. The whole system is designed around the ingenious idea of providing visual contrast to the phonemes where the lip-patterns do not eg consonant sounds /m/ /b/ /p/ are the same on the lips and so will have contrasting handshapes to differentiate them, vowel sounds /ee/ and /i/ have the same lip patterns and are differentiated by their 'positions' either at the mouth or the throat respectively. Cueing is simply a manual mode that can be applied to any spoken language. Signing gives deaf babies visual access to a spatial language, cueing gives deaf babies visual access to a phonological language.

Everyone begins cueing very slowly and rather laboriously but parents and babies grow their cueing and cue-reading skills together at their own pace and those who use it consistently find they can quickly apply it in increasingly complex interactions. They are of course only giving them visual access to the 'sound' of these words just as anyone has when they hear them – helping a child link meaningful content to these 'sound forms' is the identical experiential process for us all – real life.

If and when the acoustic signal is, in later months, amplified enough by hearing aids or an implant to be meaningfully perceived by the brain, the neural pathways involved in speech processing will have already been stimulated, thus easing rehabilitation as argued by Jacqueline Leybaert at ULB in Brussels and Carol LaSasso at Gallaudet in America[2]:

"Cued Speech can also enhance the benefits of cochlear implants by training the brain to make better use of the signal from the cochlear implant."

Recent research[3] from the Biomedical Research Centre in Nottingham also argues for the benefits of visual stimulation to optimise restoration of hearing (in adults) after implantation which is contrary to beliefs underpinning some previous recommendations – see article on page 45.

"Recruitment of auditory brain regions by visual speech after implantation is associated with *better speech understanding* with a cochlear implant. This suggests adaptive benefits of visual communication because visual speech may serve to optimize, rather than hinder, restoration of hearing following implantation. These findings have implications for both neuroscientific theory and the clinical rehabilitation of cochlear implant patients worldwide." *(emphasis added)*

Our experience leads us to believe that this is the case irrespective of age.

Anyone who has interacted with babies has surely experienced what scientific research is now confirming, that speech perception for every baby is naturally a multimodal experience. Humans' brains work hard from birth to integrate all the sensory signals into a coherent perception and this is particularly the case for the audio-visual channels.

Sign language is arguably naturally accessible for a deaf child, not because the signs themselves contain intrinsic meaning but because signing is freely accessible through the child's unimpaired sense of vision. We know, however, that the vast majority of deaf babies are born into non-signing families. If these families were able to put some of their time into learning to cue – understanding the basics takes about two to four hours and most master it within 20 – fluency could naturally evolve for them as they apply it to the language they already use. This would give their deaf child the same unconscious understanding of the home language that hearing children have and parents can do all the same rhyming, sing-song, sound play that enriches early language. When it comes to literacy, their deaf child can then learn to consciously manipulate the phonemes and link them to spelling choices in the same way as their hearing peers.

The need for parents to cue changes over time, once it has fulfilled its purpose and their deaf child shares a fluent mental model of the home language/s (cueing can be used with at least 63 languages and dialects) they may lessen how much they use it or stop altogether. Their child may then be able to rely on speech-reading alone and listening where applicable and may verbally express themselves or sign. Families may only use it from then on to increase their child's vocabulary, to clarify pronunciation or as a safety-net guaranteeing continued access to language at times when audition alone is not possible or sufficient eg in noisy environments or when technology is not used. We must never underestimate the levels of fatigue experienced by children using audition alone or speech-reading without cues, this has real implications for the brain's cognitive capacities and often families switch back to cueing to relieve their child's exhaustion.

Cued Speech UK is currently able to offer parents with babies under four years old free training and support through their 0-3 project. We are also offering free workshops for professionals wishing to find out more, the clear message to professionals is that *you do not need to learn to cue yourselves* – simply learn *about it* so that you may feel confident in sign posting families and support those who choose to use it.

References:

1. Levine D, Strother-Garcia K, Michnick Golinkoff R and Hirsh-Pasek K (2016). *Language Development in the First Year of Life: What Deaf Children Might Be Missing Before Cochlear Implantation* www.ncbi.nlm.nih.gov/pubmed/26756156

2. Leybaert J and LaSasso C J (2010). *Cued Speech for Enhancing Speech Perception and First Language Development of Children with Cochlear Implants* available here: www.ncbi.nlm.nih.gov/pubmed/20724357

3. Anderson CA, Wiggins IM, Kitterick PT and Hartley DEH (2016). *Adaptive benefits of cross-modal plasticity following cochlear implantation in deaf adults* https://www.ncbi.nlm.nih.gov/pubmed/28808014

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