

















Cues of American English

Visually providing the building blocks needed for communication, language development, and literacy

	
/d, p, zh/	/ee, ur/
	
/k, TH, v, z/	/aw, e, ue/
	
/h, r, s/	/a, i, oo/
	
/b, n, wh/	consonant alone
	
/f, m, t/ vowel alone	/uh/
	
/l, sh, w/	/ah, oe/
	
/g, j, th/	/ay, oi/
	
/ch, ng, y/	/ie, ou/

Advancements in cochlear implant and digital hearing aid technology have grown rapidly in the 21st century. Even with such advancements, it still remains that such hearing devices are not a cure for deafness, nor are they guaranteed to provide deaf and hard of hearing children with full access to spoken language. Access to sound is only one part of the equation when it comes to comprehending speech and spoken language. Until a prelingually deaf or hard of hearing child begins expressing themselves verbally, it is not possible to gauge how much they actually hear and understand via their hearing device(s). Using cued language in conjunction with hearing devices ensures maximum access to language, regardless of hearing ability.

Speech-language pathologists who support children who are deaf or hard of hearing have found cueing to be essential in their work. Cueing provides visually clear and consistent access to English (and other spoken languages), supporting learning of vocabulary, word endings, grammar, and linguistic complexity in conversational settings, academic settings and more. They also have seen how cueing integrates visual, tactile, and kinesthetic aspects as tools in therapy focused on articulation.

Providing the child with multiple communication partners who know how to cue enhances the immersion experience and opportunities for incidental learning of language. Therefore, in addition to a child's speech-language pathologist, all of a child's service providers, including their teacher, audiologist, and other therapists—physical and occupational—are encouraged to learn to cue to provide cued language access to the child as well.

What benefit do hearing devices provide? Cochlear implants and digital hearing aids have changed the way children who are deaf or hard of hearing receive auditory information. These devices typically provide improved access to sounds and more opportunities to learn through listening.

Why are hearing devices, including cochlear implants, not enough? Outcomes for children who use hearing devices vary widely. *Not all children benefit greatly from hearing devices because...*

- nearly 40% of children who are deaf or hard of hearing have secondary disabilities that may affect auditory, language, and/or information processing.
- hearing devices have not solved the problems of distance and background noise.
- hardware problems can occur, resulting in degraded quality of sound.
- the child may be unable to hear when the device is malfunctioning or accidentally turned off.
- some devices, including cochlear implants, are not successful or cannot be programmed to maximum benefit (e.g., children may not be able to tolerate input at some frequencies).
- otitis media with effusion (OME) degrades the conveyance of sound by the cochlear implant to its user. OME is a fairly common condition for kids in early childhood and it can impede auditory learning in cochlear implant users. Having repeated bouts of ear infections with fluid or mucus in the middle ear space may make a child's cochlear implant experience of sound inconsistent, creating a barrier for detecting or discriminating one speech sound from another.

How can you ensure success with hearing devices? Cue consistently, even when the child is wearing the hearing device. *Cueing ...*

- gives visual clarity to children with hearing devices, including cochlear implants.
- safeguards language development by giving specificity to what is heard.
- overrides the problems with distance, noise, and reverberation.
- provides visual access to language when the device is off or not working properly.
- serves as an additional visual language-access modality supporting language and speech development for children with secondary learning or processing issues.

What do professionals in the fields of education and speech-language pathology observe in children with hearing devices, including cochlear implants, who cue? *These children...*

- develop an internal phonological model of spoken language, which helps establish the foundation for literacy.
- interpret the sounds that they are hearing and verify them through cueing.
- have a safeguard for language development and literacy.
- can keep up with the speed and amount of information they are exposed to in their educational setting, similar to their hearing peers.

Where's the proof? *Research shows that speech/phonological processing includes both visual and auditory processing.*

- Speech, for hearing people, is a bimodal percept when they hear and see the voice and mouth movements of the speaker. The brain combines what it hears and sees to make the best guess of what is said. Children who receive hearing devices that are appropriately programmed to their needs before 30 months of age are able to fuse the auditory and visual aspects of spoken language.
 - van Wassenhove, V., Grant, K. W., & Poeppel, D. (2005). Visual speech speeds up the neural processing of auditory speech. *Proceedings of the National Academy of Sciences*, 102(4), 1181–1186. <https://doi.org/10.1073/pnas.0408949102>
- While cochlear implant (and hearing aid) technology has improved, filtering out background noise is still problematic. Therefore, individuals who use hearing devices may have a difficult time communicating in noisy environments.
 - Niparko, J. K. (2000). *Cochlear implants: principles & practices* (2nd ed.). Lippincott Williams & Wilkins.
 - Yost, W. A. (2000). *Fundamentals of hearing: An introduction* (4th ed.). Academic Press.
- Information delivered visually through cued language may help to refine the speech perception received through the cochlear implant.
 - Leybaert, J., & Alegria, J. (2003). The role of Cued Speech in the language development of deaf children. In *Oxford handbook of deaf studies, language, and education* (pp. 261–274). Oxford University Press.
- Children who have clear access to cued language and visually comprehend discrete words prior to implantation are generally able to transfer their phonological awareness from the visual channel to the auditory channel after several months of implant use. For children with limited access to language prior to implantation, cueing facilitates speech perception and builds the phonological awareness needed to develop spoken language.
 - Descourtieux, C., Groh, V., Rusterholtz, A., Simoulin, I., & Busquet, D. (1999). Cued speech in the stimulation of communication: an advantage in cochlear implantation. *International journal of pediatric otorhinolaryngology*, 47(2), 205–207. [https://doi.org/10.1016/s0165-5876\(98\)00145-1](https://doi.org/10.1016/s0165-5876(98)00145-1)

- Recent fMRI data show that deaf adult cuers decode phonemic information much as hearing adults do.
 - Aparicio, M., Peigneux, P., Charlier, B., Balériaux, D., Kavec, M., & Leybaert, J. (2017). The neural basis of speech perception through lipreading and manual cues: Evidence from deaf native users of Cued Speech. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.00426>
- Children with cochlear implants who used cued language showed rhyme sensitivity equivalent to age-matched peers. Exposure to cued language reinforces the cross-modal interaction between auditory and visual cortex.
 - LaSasso, C., Crain, K. L., & Leybaert, J. (2003). Rhyme generation in deaf students: The effect of exposure to cued speech. *The journal of deaf studies and deaf education*, 8(3), 250–270. <https://doi.org/10.1093/deafed/eng014>
- The combination of speechreading and cued language remains extremely important for persons with hearing loss, particularly in adverse hearing conditions.
 - Bayard, C., Machart, L., Strauß, A., Gerber, S., Aubanel, V., & Schwartz, J.-L. (2019). Cued speech enhances speech-in-noise perception. *The journal of deaf studies and deaf education*, 24(3), 223–233. <https://doi.org/10.1093/deafed/enz003>

Author: Jane Smith

Revised by: Hilary Franklin, Karen Doenges