NCSA National Cued Speech Association

On Cue

Volume 23 Issue 3 Winter 2009

A Family with Cochlear Implants and Cued Speech

by Marcia Beveridge

Why does our family cue with our two preschool-age sons who use cochlear implants? We frequently field this question from both the general public and certain professionals who serve the deaf and hard of hearing. Those aware only of signed language as a visual communication option are trying to reconcile what seems to be a contradiction: we are "signing" to children that seem to hear just fine. Their question sometimes reflects nervousness, as they worry that they will be unable to communicate unless they can "do that hand thing" also. When

Aidan and Alan Beveridge (Marcia Beveridge)

asked by professionals of the auditory-oral or –verbal persuasion, the question is usually tinged with disappointment, as most of them regard anything visual in communication with the hard of hearing as a "crutch" that creates dependence. Both Cued Speech and cochlear implants are necessary to provide our children complete access to receptive and expressive spoken language: together they make every word count. We try to convey to the general public that Cued Speech, unlike American Sign Language, makes spoken language clear and completely accessible. ("It clarifies lipreading" is the one-liner that we usually say in the grocery store, etc., and is generally followed by a relieved expression on the part of the questioner who now feels that they can talk and be

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Cued Speech for Enhancing Speech Perception of Individuals with Cochlear Implants

by Jacqueline Leybaert, Cécile Colin, & Catherine Hage

Editor's Note: A preview of Cued Speech and Cued Language for Deaf and Hard of Hearing Children includes a chapter on Cued Speech and Cochlear Implants.

Introduction

This volume documents how deaf children who have been provided with Cued Speech successfully use language representations in major cognitive activities like reading, spelling, remembering, and rhyming without auditory input. The main source of improvement in these cognitive skills is the advantage provided by Cued Speech for speech perception which leads to the natural acquisition of English and other traditionally-spoken languages.

In one of the first studies addressing the issue of spoken language perception, Nicholls and Ling (1982) studied a group of Australian profoundly deaf children educated with Cued Speech at school with for at least three years. They found that speech reception scores of these children increased from about 30 percent for both syllables and words in the lipreading condition to more than 80 percent in the lipreading + cues condition. They emphasized that the children's average scores in the lipreading + cues condition were within the range of normal hearing listeners' reception scores of similar material from audition.

Périer, Charlier, Hage and Alegria (1988) studied the advantage provided by the addition of cues to French sentence comprehension. They found an increase from 39 percent correct responses in the lipreading condition to 72 percent in the lipreading + cues

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President's Message

Communication, Collaboration and Community

by Josh Libby

Going into the new year, I have been reviewing my year of service and attempting to take stock of our organization's immediate and long-term goals. One thing that seems particularly essential is an increased emphasis on communication and collaboration, which includes using new social media and networking tools. In the past year, it has become easier to communicate and exchange ideas with our constituency, the deaf and hard of hearing community, other groups and the world at large. I invite all of you to join me as we move forward into the next decade.

I am excited by this issue of *On Cue*. We felt it was important to talk about the role of Cued Speech and cochlear implants, not just with children, but also with native cuers who received implants as adults. Cochlear implants and Cued Speech complement each other so well and my wish is to proceed toward a greater public recognition and acceptance of Cued Speech by the cochlear implant, medical and educational fields.

In November, Google announced a new and promising feature: automated captioning the millions of YouTube videos. We are also proud to say that HR3101, the Web Accessibility bill, is being advanced through Congress. The Coalition of Organizations for Accessibility and Technology (COAT), of which we are an affiliate, has worked hard to champion this bill.

Our precedents wielded the mighty pen and paper, typewriter, and word processing software. In addition to those tools, we now have the power of Web 2.0 and Internet social marketing tools that include Facebook, Twitter, LinkedIn, and more.

We have strengthened relationships with our respective partners in COAT and Deaf and Hard of Hearing Alliance (DHHA), as well as within our own community, with an eye towards developing further collaboration with other nonprofit organizations that focus on the scope of deafness, language development, and more.

I am also truly impressed by our newest vehicle of collaboration and outreach, which was developed and championed by Maria Gildea. Our inaugural Read-a-thon, held during October, was a smashing success! We are proud of our new program, and we intend to use it to help spread the word. I would like to thank those that went above and beyond to make our inaugural Read-a-thon possible: Maria Gildea, Robert McIntosh, Esther Rimer, and Chris Parisi of TurfDawgs; authors Jean Craighead George, Henry Kisor, David Lee, Laura Numeroff, and J. Parrish Lewis; our spokesperson Paul Rabil; and, last but not least, the schools that invited us into their classrooms! Thank you for all your work and support!

I would love to hear from you if you have any thoughts or suggestions for future Read-a-thon incentives. Please contact me at jlibby@cuedspeech.org.

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Editor's Note

by Aaron Rose

In the 1980s, a number of native deaf cuers were involved in the cochlear implant trials mainly because they already had a means of accessing spoken language through Cued Speech. Many of those deaf cuers paved the way for the next generation of children with hearing loss to receive cochlear implants and acquire spoken language at younger ages than ever before.

In this issue you will read about the combination of cochlear implants and Cued Speech through the perspectives of a parent, a professional, research scientists, and native deaf cuers. All these experiences vary, yet demonstrate the great potential in integrating both the auditory and visual inputs to enhance perception of spoken language.

Even with all the advances made in recent years with implant and processor technology, the need for a visual mode of communication still exists for some deaf and hard of hearing children. Not all children with hearing loss demonstrate any benefits from the use of cochlear implants for various reasons, some of which still remain to be determined. Here the need for access to spoken language becomes more evident even as advancementsoccur.

On another note, one way that the NCSA honors Dr. R. Orin Cornett and Carol Shuler is through scholarships for students in post-secondary education. If you are a college student or know someone who is currently or will begin post-secondary studies, be sure to go to the NCSA's web site to find those scholarship applications. Past scholarship winners have demonstrated the desire to contribute to the Cued Speech community through advocacy, leadership and sharing their experience with the public.

Your donations to the NCSA ensure that programs such as the Cornett and Schuler scholarships continue to support individuals who use Cued Speech as their primary mode of communication both at home and in the classroom.

One way NCSA members can contribute to the Cued Speech community is through participation in research and pilot studies. Such a pilot study is taking place right now at the University of South Florida. Experienced cuers can submit videos of themselves cueing and receive a one-year membership to the NCSA. Those cuers also can get the satisfaction that they are helping develop ways to rate cuers in various aspects including accuracy, clarity, and speed. The goal of this screening tool is to help cuers advance their cueing skills.

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We are currently looking for people to serve as correspondents and photographers. If you would like to contribute to On Cue*, please contact us at oncue@cuedspeech.org.*

Pilot Version of New Cued Speech Screening Tool Released: Participants Needed

December 16, 2009 – The National Cued Speech Association (NCSA) is pleased to announce the pilot version of a new Cued Speech screening tool designed to assess conversational cueing skills. Developed at the University of South Florida under the direction of Dr. Jean Krause, the screening tool evaluates how well a cuer is understood when cueing continuously for 25-30 minutes. Areas of assessment include prosody, accuracy, clarity, and speed as well as cueing form. Classroom teachers, parents, transliterators, and any other Deaf or hearing cuers comfortable cueing at the conversational level are encouraged to participate in pilot testing. Interested individuals are expected to have experience cueing at a conversational level and should be able to cue for an extended period of time. Participants will be asked to videotape themselves cueing a prepared presentation on a pre-selected topic as well as extemporaneous responses to one or more conversational prompts. A free one-year membership in the NCSA will be awarded to all individuals who participate. Participants will also be provided with written feedback of their cueing skills.

Interested in Participating?

Contact Morgan Tessler
E-mail: mtessler@mail.usf.edu
V/SMS: 813.731.1858

More information available at:
http://www.cuedspeech.org/PDF/Misc/flyer1pilotTest3.pdf

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picture of spoken language that Cued Speech provides is the way to true independence in the hearing world.

Using Cued Speech makes every word count by allowing us to maintain communication when the implant technology cannot be used and in difficult listening situations. We almost daily avert disasters in the bathtub (and other watery environments) with clear, fluent communication.

A dramatic example of the value of having a way to communicate visually came when we evacuated our home, which was in the path of a wildfire. We left the house with the clothes we had on our backs; the battery chargers had to be left behind. When the batteries died that evening, our deaf children calmed down immediately following our cued discussions of the strange surroundings and events.

Restaurants and other noisy surroundings do not give us concern that they will be left out of conversation. One of our favorite memories is that of a meal in a Greek restaurant packed with chatty diners. When we cued across the table to our 3-year-old that he was eating "laudia" (a dessert he was trying for the first time), he sternly informed us, repeating the word with perfect clarity, "It's not laudia, it's banana bread."

But we not only cue in situations when the implant must be off or when we know it is a difficult listening environment. In fact, we not only cue directly to them, we try to cue everything we say—phone conversations, discussions between hearing family members—and we try to keep expanding our cueing skills. We are fighting for classroom transliterators and we persuade teachers to learn the system. Why would a family with so much to juggle make this a priority?

Cued Speech enables our children to make the most of their cochlear implants. They are enabled not only to respond to clear direct communication, but also to gain language through overhearing—the way children learn language best and the way technology has yet to truly succeed in making that accessible. Their brains are constantly triangulating sounds, especially speech that is not visually clarified, using context to fill in what was misheard or not heard. This process requires solid knowledge of the language being used.

For example, a cueing therapist was reading a book to one of the boys one day. While he gazed at the page, she said "Look, a zebra. Black and white stripes." He repeated, "Glass and white?" When she had him look at her as she cued "Black and white," he got it immediately, repeating "Black and white." The next time he hears what seems to be "glass and white," his brain will go through an unconscious process "this is what I heard, but we're talking about colors, so it must be "black and white." How much more important is it for a language learner to have clear access to vocabulary, syntax, and grammar?

One answer to that question came a few months ago during testing for our son who is preparing to enter school. The day after he had had auditory comprehension testing, on which he was correctly repeating back about 90 percent of the speech pathologist's sentences, he had an audiogram. Despite pure-tone thresholds in the mild hearing loss range across all frequencies for both his implants, the audiologists' speech perception testing revealed the true challenge our son is faced with when left to learn language through auditory means alone. He made numerous discrimination errors of the glass/black type, perceiving with complete clarity 70 percent, at best, of the words he heard. Our suspicion was confirmed: the input from cochlear implants alone is inadequate for complete, clear, facile language learning.

How does he bridge the gap from 70 percent single-word perception to 90 percent correct sentence repetition?

Alan Beveridge (Marcia Beveridge)

The solid knowledge of language he has gained through Cued Speech, on par with hearing children his age, allows him to use context to correctly fill in the unheard or misheard words in a sentence, which is why the general public does not have to do "that hand thing" in order to communicate. However, at home and in the classroom, those of us responsible for presenting spoken language must present it as clearly as we would to a child with full hearing. Cueing is the most natural way to do this for spoken language, the only way for the preliterate child.

Since cuers had good access to language long before cochlear implants were in the picture, how do the implants help make every word count? It still seems miraculous that our profoundly deaf child can holler from behind a closed door, "Go get my scissors!" and his brother with a severe hearing loss will answer, "OK, I'm going upstairs for scissors!"

There are times when we have to fall back on auditory-only means of communication. Sometimes directions ("Stop!") must be given with utmost speed to allow bodily integrity to be maintained ("His fingers are in the door!"). Visual contact can be difficult to obtain or maintain with small people who are constantly on the go. At times it is difficult, if not impossible, for grownups to free a hand: southern California traffic can require two white-knuckled hands on the wheel. In those circumstances we are grateful for the

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ability to give verbal-only answers to questions. Then, too, humans have their limits: in our family, some are more conscientious cuers than others, but rather than create resentment by constantly badgering them to cue, we accept what they can do. Last, but not least, for those times when just finding the words to express a murky or tangled thought takes all our effort, we have the freedom to simply speak our mind and then clarify what we have said.

How has making every word count impacted our family? We do not have words to express how blessed we are. When we began this journey with hearing loss, our most challenging goal was to give all of our six children as normal a childhood as possible. For the hearing ones, that meant that the spoken language of our home should flow as naturally as before, but also that their own needs could be met even if it meant temporarily taking our focus off the language lessons that the Auditory-Verbal therapists wanted us to be immersed in. All of our children know that whatever family health, economic, or educational crisis arises, we can respond to them with the attention they need, knowing we are always providing clear language although it may take a month to complete a lesson that the therapist wanted done in a week. For our sons, the hearing that the cochlear implants provide has made speech and language therapy an eagerly anticipated event and a source of confidence instead of the dull, self-esteem eroding chore we were afraid it would become.

From time to time, we hear rumors to the effect that prestigious implanting institutions somehow don't really believe in the efficacy of what they are doing. Legitimately concerned by implanted children's sometimes less-than-optimal language and literacy results, they drag their feet with candidates, or outright refuse them. Others perform the surgery, but then recommend signed language as the primary mode of communication. How sad to think children are denied the power of technology because the tool that makes it truly useful is unknown, ignored, or discounted. For us, the bridge of technology rests on the pillars of language clarity and completeness provided by Cued Speech. On this structure, our family has the freedom to traverse the chasm of inadequate communication with confidence that we can make every word count.

2010 NCSA Calendar of Events

April
Basic Instructor Workshop (4/9 - 4/10)
NCSA Board Meeting (4/9 - 4/11)
Instructor Certification Exam (4/11)
Salt Lake City, UT
Minnesota Cued Speech Retreat (4/9 - 4/11)
Camp Confidence, Brainerd, MN

May
Spring Camp Cheerio (5/14 - 5/16)
Glade Valley, NC

June
Cue Camp New York (6/24 - 6/27)
Nazareth College, Rochester, NY

July
Cue Camp New England (7/28 - 8/1)
Governer Baxter School for the Deaf, Falmouth, ME

September
Cue Camp Virginia (9/23 - 9/26)
Jamestown, VA

October
Basic Instructor Workshop (10/22 - 10/23)
NCSA Board Meeting (10/22 - 10/24)
Instructor Certification Exam (10/24)
Rochester, NY

For more information, go to http://www.cuedspeech.org/sub/general/events.asp

Cued Speech and Cochlear Implants: Powerful Partners

by Jane Smith, M.A., LSLS Cert. AVEd, Communications Specialist, Montgomery County Public Schools, MD

"We've stopped cueing because he just hears everything!"

"There used to be a need for Cued Speech, but with cochlear implants, it's just no longer necessary."

"My child hears EVERYTHING with his two implants."

These are examples of statements I've been hearing in the past few years. Parents and colleagues tell me that cochlear implants are a miracle and that there is absolutely no need for deaf children to use visual information any more. In fact, some folks even add that visual information is detrimental to deaf child's ability to learn to listen.

Nonsense, I say. For over 25 years, I have been using Cued Speech with children who have cochlear implants. While I would agree that cochlear implants are amazing and that this technology has changed the way I teach, I would adamantly disagree that they have lessened or wiped out any need to use Cued Speech. In fact, I see Cued Speech as an excellent means for helping deaf children learn language, develop speech, learn to listen to their maximum ability, and develop high-level reading skills.

In Montgomery County, Maryland, we have a large deaf and hard-of-hearing population. We have many children who learn by adding Cued Speech to their use of listening technology. In other words, they listen while they are cued to. Most of our students have cochlear implants. Many received their cochlear implant(s) as young as a year old. These children are excellent listeners, good speakers and wonderful readers, all thanks to Cued Speech.

Here are some observations: Babies who are cued to as infants internalize a phonological model of language. As the baby babbles and coos, parents imitate the sounds the baby is saying while cueing and speaking right back to him. The baby loves to see and hear that Mama is repeating the sounds he is making! Just as hearing babies learn to discriminate and imitate phonemes, babies who are cued to discriminate and imitate phonemes! Most babies are not implanted until they are at least one year old. By cueing as soon as possible, parents can establish a phonological grid even BEFORE he has the implant surgery.

As the baby learns more and more language, you can cue to him in order to be very specific about what you are saying. For example, instead of just talking about "shoes," you can expand a child's vocabulary and talk about "Crocs" or "Mary Janes" or "flip-flops" or "Uggs" or "slippers." The possibilities are endless. By seeing the cues AND hearing the sounds at the same time, the child can be more sure of what he is hearing and thus imitate the words more correctly in his speech.

Children who get a cochlear implant (or a second implant) after they have been exposed to Cued Speech make quick listening progress. They already have a phonological grid in their brain and what they are hearing makes sense quickly with Cued Speech. They tend to zoom through listening curriculums.

Cued Speech also can ensure language development for children who might have an additional disability. There is evidence that nearly half of deaf children have additional problems. These may be subtle learning disabilities or more serious disorders like apraxia, language processing disorders, or cognitive disabilities. Children, including hearing children, are often labeled as "visual," "auditory" or "tactile" learners. By cueing to a child at an early age, you are stimulating other senses for him. Cued Speech is visual representation of speech that totally complements what

he or she is hearing. If the child learns to cue, the tactile support of making sounds (cues) on his fingers may make understanding language easier for him. This support nearly ensures a child with disabilities, even a subtle disability, learn more easily.

And reading…! Cued Speech's connection to reading is well researched. It is a phenomenal benefit to a deaf child's ability to learn to read. If you cue to a child with a cochlear implant from an early age, it can only help him learn to rhyme, differentiate phonemes and associate phonemes with print. These are the cornerstones to becoming a good reader.

Cued Speech is an incredible tool, system and mode of communication. It will not slow or impede a child's progress with a cochlear implant. It will actually enhance a child's progress and squarely put him on the road to becoming a great reader.

Cued Speech and cochlear implants were made for each other!

Editor's note: For additional information about using Cued Speech with cochlear implants, please check out the following PowerPoint that Jane Smith created for her presentation at the NCSA Conference in 2005: http://www.cuedspeech.org/PDF/Cued%20Speech%20and%20Cochlear%20Implants--Smith.pdf.

NCSA Inaugural Literacy Read-a-thon

The NCSA utilized innovation for fundraising by creating the Literacy Counts Read-a-thon program (www.literacycounts.org). The Literacy Counts Read-a-thon was developed as a community service program, with the goal of raising awareness for deafness, Cued Speech, and deaf literacy. Our inaugural Read-a-thon had three schools participating. Children were encouraged to read books and develop their literacy skills, while raising money through pledges for both their school and the NCSA. The results are in: students read, on average, an additional hour a night, and raised an average of $40 per student! Fortunately, this program boosted the coffers of the schools, and ours, too. Overall the Read-a-thon mutually benefited both the NCSA and each school, with each keeping 60% and 40% of the proceeds raised, respectively.

Canterbury Woods Elementary School, Annadale, VA	
Minutes read	**94,752**
Total raised	**$6,629.10**
Boothbay Regional Elementary School, Boothbay Harbor, ME	
Minutes read	**81,639**
Total raised	**$1,879.66**
HSDC Ned Behnke Speech Language Preschool, Seattle, Washington	
Total Raised	**$121.70**
Total Minutes Read	**176,391**
Overall Total Raised	**$8,630.45**

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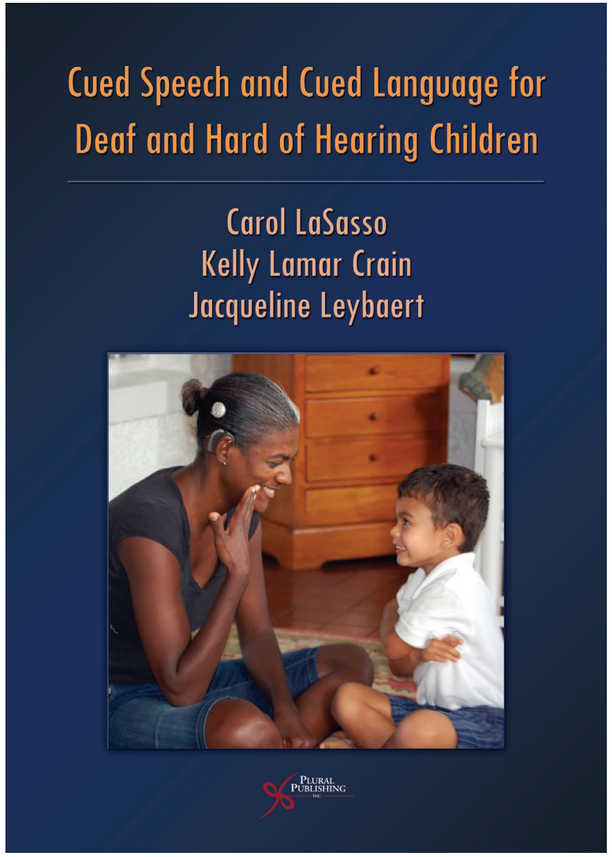
condition for a group of children exposed early to Cued Speech, and from 37 to 53 percent for those who were exposed to Cued Speech later and only at school, suggesting a variability related to experience in perceiving and discriminating the phonetic structure of Cued Speech.

Now that most children born profoundly deaf are fitted with a cochlear implant during the early language learning years (Spencer & Marschark, 2003), the need for using Cued Speech might be less apparent. Improvement in children's hearing via cochlear implants is impacting on strategies of perception of oral language (Geers, 2006). That is, with auditory training, many children with cochlear implants may understand speech sufficiently without having to look at the speaker. However, even for normally hearing people, speech detection and intelligibility are influenced by a speaker's face. From the seminal work of Sumby & Pollak (1954), it is known that visual speech information dramatically enhances the identification of speech when the auditory information is degraded by noise. Auditory and visual modalities are complementary in the transmission of phonetic features. While voicing and manner of articulation are quite resistant to noise, place of articulation is not. Information about place of articulation, in contrast, is transmitted well via the visual modality (Summerfield, 1987). This multimodal nature of speech reception has been shown through the well-known and commonly cited McGurk effect (McGurk & MacDonald, 1976).

Another compelling reason for considering the multimodal nature of speech reception through a cochlear implant and the benefit of visual integration in speech perception is the fact that the signal delivered by the cochlear implant remains imprecise and incomplete. Recent advances in psychoacoustic research have clarified the role of two types of temporal information in speech perception: (1) frequency information and (2) temporal fine structure. "The auditory system performs a limited-resolution spectral analysis of sounds using an array of overlapping 'auditory filters' with center frequencies spanning from 50 to 15,000 Hz. The output of each filter is like a bandpass filtered version of the sound, which contains two forms of information: fluctuations in the envelope (the relatively slow variations in amplitude over time) and fluctuations in the temporal fine structure (the rapid oscillations with rate close to the center of the frequency of the band). The temporal fine structure is often described as a 'carrier' while the envelope is described as 'an amplitude modulator applied to the carrier'" (Lorenzi et al., 2006). Currently, cochlear implants typically use 16-22 electrodes placed along the tono-topic axis of the cochlea, each electrode being designed to provoke a frequency-specific neural activation; however, within each region of stimulated neurons, the temporal fine structure of neural response is quite different from that occurring in a normal cochlea (Shannon, 2007).



The book is in pre-print and will be made available in March 2010. Pre-orders can be made at Plural Publishing online at http://www.pluralpublishing.com/publication_cscldhhc.htm

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Modern cochlear implants provide good information about the slow variations in amplitude of the envelope; however, they are poor at transmitting frequency information and information about temporal fine structure (Glasberg & Moore, 1986; Grosgeorges, 2005; Lorenzi et al., 2006).

The lack of temporal fine structure in cochlear implants has consequences on the perception of phonetic features, on degradation of speech perception by noise, and on the perception of musical pitch. At the phonetic level, place of articulation and voicing are mostly impaired, whereas the transmission of manner is well-preserved. Consequently, individuals with a cochlear implant confound minimal word pairs that differ only by place of articulation, such as buck/duck (Giraud, Price, et al., 2001), which create confusions in acquisition of meanings by children. Due to the fragility of the transmission of phonetic features, speech perception through a cochlear implant is dramatically impaired in noisy listening environments (Fu & Nogaki, 2004; Lorenzi et al., 2006). Individuals with a cochlear implant also have difficulties in perceiving musical information related to pitch, while the information about rhythm is relatively well preserved (Fearn & Wolfe, 2000; Frère & Leybaert, 2007). These problems are currently being addressed by the companies who develop cochlear implant technology, and will certainly be reduced in the future (see for example http://www.phys.unsw.edu.au/jw/Cochlear.html). Until that time, however, these problems might best be addressed via visual support.

Given these limitations of cochlear implants, it is reasonable to believe that speechreading and manual cues of Cued Speech remain of valuable use for speech perception by children with a cochlear implant who are in the process of language development. In the following sections, we will discuss research related to the positive effect of visual speech information on language perception at the level of: (1) phonemic syllables; (2) word and pseudoword identification, and (3) morpho-syntactical development.

Integration of Auditory and Speechread Information on the Phonetic Perception of Syllables

Deaf children fitted with a cochlear implant have been found to perform better on speech recognition tasks when visual information is available conjointly with the auditory information rather than when only the auditory information is available (Lachs, Pisoni, & Kirk, 2001; Rouger, Lagleyre, Fraysse, Deneve, Deguine, & Barine, 2007). Given their limited auditory experience, individuals with a cochlear implant might rely more on speechreading than normally hearing children (Clarke, 2003; Rouger et al., 2007).

If audio-visual integration mainly depends on the balance between the weight devoted to the processing of auditory and visual information, it is likely that the way the cortex integrates auditory and visual signals is different in children with a cochlear implant than it is in normally hearing children. A critical variable in the development of audiovisual integration might be the precocity of implantation. Auditory speech perception scores after implantation are better when children have been fitted before the age of three, and even two years old (Baumgartner, Pok, Egelierler et al., 2002; Tyler, Fryauf-Bertschy, Kelsay et al., 1997; Snik, Makhdoum, Vermeulen et al., 1997; Svirsky, Teoh, & Neuburger, 2004). Early implantation would allow auditory networks to maintain more of their initial functionality. Children fitted early with a cochlear implant could more readily exploit the phonetic relations between auditory and visual signals, and, thus, develop audio-visual processing mechanisms earlier and more efficiently...

In order to test the effect of exposure to Cued Speech, Colin et al. (2008) administered the same experiment to a group of deaf children fitted with a cochlear implant who had not been exposed to Cued Speech. These children showed the same reliance on speechreading than the Cued Speech-users when the visual syllable did not correspond with the auditory syllable.

Taken as a whole, these findings suggest that when faced with conflicting audiovisual stimuli, children fitted with a cochlear implant seem to rely mostly on visual speech information. Their auditory speech skills, which appear to be moderate in the AO condition, may be too fragile to resist when they are put into competition with visual processing. It must be noted that the McGurk experiment mimics fairly well the watching of a dubbed film on television; that is, the auditory information is not congruent with the information they could read on the lips. Given that many of the children have confidence in what they read on the lips, without perceiving the sound, it means that they should have problems watching dubbed films. Many of the participants reported this was the case.

Children with cochlear implants rely more on speechreading than normally-hearing children for different reasons. First, they might assign more weight to the visual speech information because the auditory information is degraded. This is evident in the case of normally hearing participants who must recognize stimuli consisting of spectrally reduced speech (SRS). The information about place of articulation is only partially transmitted in SRS, and normally hearing participants show larger McGurk fusion effects with SRS than with normal speech (Berthommier, 2001; Grant et al., 2007). The parallel between perception of SRS by normally hearing adults and

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perception of speech by children with a cochlear implant is that, in both cases, the speech information conveyed by the high frequencies, which is important to perceive the place of articulation, is degraded. Therefore, it is not surprising that children with a cochlear implant who have only partial access to place of articulation information through the auditory channel rely more on speechreading to process place of articulation. When auditory and visual information are put into conflict, their perception of speech is captured by visual information.

Second, the visual predominance of cochlear implant users might also be explained in terms of reorganization of neural resources in the case of deafness followed by cochlear implantation. Early deprivation of auditory information, as in congenital hearing impairment, can lead to a reorganization of neural resources, with a potentially larger involvement of auditory cortex in the processing of visual stimuli (Neville, Schmidt, & Kutas, 1983; Neville & Lawson, 1987). It has been found that the auditory cortex of deaf persons, once reorganized by cross-modal plasticity after years of deafness, can no longer respond to signals from a cochlear implant (Champoux, Lepore, Gagné & Théoret, 2009; Doucet, Bergeron, Lassonde, Ferron, Lepore, 2006; , Lee, Lee, Oh, Kim, Kim, Chung, Lee, Kim, 2001). Children and adults implanted at later ages are at a relative disadvantage compared to children implanted early, because the auditory cortex has already been appropriated by visual modality. As Shannon (2007) notes, the auditory system of children implanted at early ages competes for cortical real estate whereas late implantation may be unable to dislodge existing cortical 'squatters.' The results of Schorr et al. (2005), which showed that children implanted later than 30 months of age fail to integrate visual cues with the auditory cues, is compatible with this view.

In summary, speech perception through a cochlear implant presents some important differences in speech perception compared to speech perception in normally hearing individuals. Children with cochlear implants rely more on visual speech information, probably because this information is more reliable than the auditory information, particularly in noisy environments. From the available research, there is no reason to discourage children with a cochlear implant from employing speechreading or using the visible manual cues of Cued Speech in addition to the auditory information available via the cochlear implant. Rather, research suggests that they need both for maximum speech perception.

Conclusions

Data collected in the 1980s and the 1990s demonstrated that the use of Cued Speech can be a powerful tool for language development and subsequent formal reading achievement by profoundly deaf children equipped with hearing aids. Cued Speech enhances speech perception through the visual modality, the acquisition of vocabulary and morphosyntax, and metalinguistic development, as well as the acquisition of reading and spelling (see Chapter 11 in this volume). More recent data seem to indicate that children who received cochlear implants benefit from previous exposure to Cued Speech; however, use of Cued Speech before implantation is likely to become increasingly more rare. Indeed, most children are now fitted with a cochlear implant around the age of one year. During the first months or years of cochlear implant use, speech perception of an implanted child remains imperfect. Oral comprehension does not develop exclusively by the auditory channel but necessitates audiovisual integration. Therefore, the addition of Cued Speech to the signal delivered by the cochlear implant might help deaf children in identifying new words. Children fitted early with a cochlear implant, thus, would benefit from multimodal input during the development of phonological representations, which would serve as the platform from which subsequent phonological awareness, reading, and spelling acquisition could be launched (see Chapter 11 in this volume).

The use of Cued Speech by children with a cochlear implant is not an automatic solution to language development of deaf children. Children may not reliably look at a speaker's lips and hands, and they may tend to rely on auditory information alone. Some parents may lose their motivation to cue, feel discouraged, or simply abandon coding with the hands. Therefore, it would be important for educators and related service providers to regularly assess whether cueing remains necessary, and under what circumstances after implantation. It is likely that after some period of auditory habilitation, children fitted with a cochlear implant would be capable of learning new words by auditory means and reading alone. Continued attention, nonetheless, should be devoted to the development of delicate, but vital, aspects of language, such as morphosyntax. This domain of language acquisition is particularly important and sensitive to a lack of precise input, as Szagun's (2004) data show. The capacity to develop morphosyntax easily in response to a well-specified input also tends to diminish with age, although the limits of a precise "sensitive period" cannot be fixed at the present time (Szagun, 2001). In short, the benefit and limits of the use of Cued Speech with children with a cochlear implant remain to be investigated more extensively. In particular, data from languages other than French are urgently needed.

National Cued Speech Association Volume 23 • Issue 3 • Winter 2009

Cue Camp Friendship

Bishop Claggett Conference Center, Buckeystown, MD, June 18-21, 2009

Camp Director Steve Scher and his son Max during the Saturday Night Dance. (Sarah Duran)

The teenage class raises their hands in victory after going through the ropes course at Upward Enteprises. (courtesy of Stephanie McAnly)

Cue Camp Virginia

Front Royal 4-H Camp, Front Royal, VA, August 27-30, 2009

The teenage class after completing the ropes course at Front Royal 4-H Camp. (Don Ballard)

Sherece Wade and Michelle Hoch work on cueing skills in the Beginners class. (Don Ballard)

Cue Camp New England

Governor Baxter School for the Deaf, Falmouth, ME, July 29 -August 2, 2009

Asma and Polly Earl read a book together in the library during literacy block. (Aaron Rose)

Nicole Dobson and Max practice cueing during a speech therapy session. (courtesy of Nicole Dobson)


Laura Cunningham


Shanna Sorrells


Nabeel Keblawi


Hilary Franklin

Deaf Cuer Profiles: Life with Cochlear Implants

by Zainab Alkebsi

Editor's Note: These profiles present various perspectives among deaf Cuers with cochlear implants, including those who have had good experiences with it, those who are unhappy with their experience, and those who have just recently received at least one implant. The responses were edited for space and/or clarity.

Laura Cunningham:
Laura is a 22-year-old graduate of UMBC with a major in Psychology. She plans to attend graduate school in 2010 for special education or deaf education. She was born deaf and implanted in 1990 and 2008 [bilaterally]. In addition to Cued Speech, Laura recently started learning ASL a few years ago so she could be a part of the deaf community.

Shanna Sorrells:
Shanna grew up in Rockville, MD, and was mainstreamed throughout her education. She is currently an Education major at Smith College and graduates in December 2010. She is participating in Williams-Mystic this semester, a coastal studies program.

Nabeel Keblawi:
Nabeel was born profoundly deaf near Washington, DC, and relocated to Houston, TX, in 2008. Just a few months ago at age 29, he received a cochlear implant. He has been writing about his experiences on his blog, http://nabeel-ci.blogspot.com.

Hilary Franklin:
Hilary grew up mainstreamed in Montgomery County Public Schools in Maryland. She graduated from the University of North Carolina at Chapel Hill with a Bachelor's in Public Policy. She earned her Master's in Teaching American Sign Language as a Foreign Language from Teachers College at Columbia University in New York, NY. Currently, Hilary works as a project associate at the American Institutes for Research in Washington, DC.

OnCue: How long have you been cueing?
Laura Cunningham: I've been cueing since 4 years old.
Shanna Sorrells: I have been cueing for about 19 years.
Nabeel Keblawi: Since I was five and a half. I'm 30 years old now.
Hilary Franklin: I learned when I was 3 ½ years old, so about 28 years now.

OC: At what point in your life did you receive the CI and how long has it been since that point?
LC: I received it in October 1990 at 3 ½ years old—almost 4 years old. My second implant was in May 2008 at 21 years old so, 19 years since the first and a year and a half since the second.
SS: I received the CI when I was 15, the summer before my sophomore year of high school, so it's been almost six years now.
NK: I got my cochlear implant in my right ear on April 29, 2009, and got activated on June 1. It has been six months since I started hearing with the cochlear implant so the cochlear implant experience is still new to me.
HF: When I was 19, the summer after my freshman year of college. So it's been 12 years.

OC: What were your initial expectations?
LC: My parents were hoping that I would be able to hear well—eventually use the telephone, etc., which did happen, due to intensive rehab (speech/listening therapy). However, with my second CI…my expectations were to try to learn how to hear with my new CI, but I did not expect to hear as well as I do with my original CI. I've been really lucky with the 2nd CI; it has helped so much and it's nice to leave the original CI off...and listen with it. It's really neat how technology has changed.
SS: My initial expectations were that it would not "cure" my hearing loss. I did not expect any miracles, but I did expect some improvement. I had done a lot of research on my own before getting the CI. I knew it would take hard work and a lot of motivation in order to get results with it.
NK: My expectations and hopes were two different things. I expected that it would be difficult to learn how to interpret sound, given the fact that I was born deaf and never built an auditory memory, especially for speech

Deaf Cuers, continued on page 13

comprehension. I was hoping that the learning curve wouldn't be as steep as I expected. The reality at 4 months post-activation? Somewhere between my expectations and my hopes, so I'm not disappointed and I have no regrets in my decision to get the cochlear implant.
HF: My initial expectation was that I would hear as well with the implant as with the hearing aid—there was no reason to expect that I would hear or understand less. I did also have the expectation that since I had used my residual hearing so well, that there would be no initial "surprises."

OC: What benefits do you think you've received from the CI?
LC: Tons! I can use the phone, I can listen to music, I can communicate with others with minimal difficulty. It's great!
SS: I have reaped major rewards from the cochlear implant. I feel much more confident with talking to people in groups. People are able to get my attention simply by saying my name. Initially after getting the CI, people told me my speech made noticeable improvement. I can hear some songs and news on the radio; I'm still working on learning how to hear those! To sum, CI has been truly life-altering. I will never regret my decision to get the surgery.
NK: I have yet to reap the full benefits of this technology, as it is very early. What I have reaped so far is improved understanding what other people are saying, as well as being able to follow some group conversations—to a degree. I was never able to do that before. Sometimes I even overhear a few words or a phrase uttered by others close to me without reading their lips! While I'm very happy with my CI thus far…, it's not all sunshine and roses. Learning how to comprehend speech takes work and it comes with plenty of frustration along the way. To quote my audiologist, I "started from scratch" and because of that, it will take me longer to learn to understand speech than a late-deafened cochlear implantee who already has an established auditory memory.

OC: Hilary, the previous question does not apply to you. Why did the implant not work out for you? What happened there?
HF: Well, I could write a thesis about this, but I won't. First of all, I couldn't really process any speech information. I was also dealing with unexpected white noise, which was pretty constant. After two months and two audiologists, we changed programming strategies, which resolved the issue. During those two months, I was frustrated with the cochlear implant center's lack of team effort in providing appropriate auditory services for an adult with congenital severe-to-profound deafness.

I had tested my implanted ear using my hearing aid to determine whether I had lost all my residual hearing and was surprised. An audiogram confirmed only about a 5-10 dB drop since the surgery. After several months, I became extremely frustrated with the implant center, as they clearly didn't know how to work with me. I knew that I couldn't go the road alone, and I didn't have the drive to battle with audiologists who were more interested in believing that they knew everything than in working/teaming with me.

So I "hung up the processor." Almost two years later, I tried another center. While the final map was a significant improvement, something still felt "off" and eventually the processor went back into my closet. I also met one of the original developers behind the implant. He asked questions that no one else had asked. He asked about my auditory processing capabilities, etc., and suggested that my other ("better") ear might have been better. He referred me to a research team studying why implants did not work as expected for some "excellent candidates." I spent five days at that research center and came away with maps that were decent for environmental information, but not for speech processing. To this day, we still don't know the exact cause(s) of why the implant did not perform as expected. I have no regrets, though.

OC: How prevalent is Cued Speech in your life now?
LC: Honestly, I rarely use it but if I am around other deaf cuers, I use it. Given that ASL is the "language" of the deaf community, that's what I use to communicate with my deaf friends and my baby sister, who is also deaf with a cochlear implant. We occasionally use Cued Speech, but we also use ASL. If I end up working with the deaf population, I will use Cued Speech with the students that use Cued Speech as well as ASL.
SS: I still use Cued Speech at home with my parents. If I misunderstand a word they say, they cue it and we are able to get over the miscommunication quickly. I use Cued Speech with one of my hearing friends in college as well. It's great because if I don't know how to pronounce a word, she can cue it to me. My friends love to speak other languages: Spanish, French, Russian, Hindi, and Romanian. My friend is able to tell me what exactly they are saying. I'm learning a few words here and there! I have a sign language interpreter since my college was unable to get me a cued speech transliterator, but I really want one.
NK: Not very prevalent. I used Cued Speech primarily for educational purposes, [and] ASL when socializing. Since I [got] my CI, my need for interpreters dropped significantly, so I don't make interpreter requests as often. Most of the interpreters I have had in the past year or two used ASL, whereas I used Cued Speech [transliterators] in graduate school between 2004 and 2006.
HF: Well, that depends on your definition of prevalent. As a certified instructor, I teach a few workshops, and I'm active on several NCSA committees. My parents both still cue, and when I'm with friends who grew up cueing, then I tend to cue with them when possible (provided no one else involved in the conversation would be left out).

NCSA Announces Availability of 2010 Scholarships

The NCSA is pleased to announce the scholarship application for the Dr. R. Orin Cornett and Carol Shuler Memorial Scholarships is now available. Both scholarships are made possible through the R. Orin Cornett Scholarship Fund, which was established in 1997 to provide financial assistance to qualified deaf/hard of hearing students pursuing post-secondary education.

The Cornett Memorial Scholarship awards $1,000 and the Shuler Memorial Scholarship awards $500 to a student from the West region (see below).

Recipients of the R. Orin Cornett Memorial Scholarship award must

- *have used Cued Speech as their primary mode of communication during their language learning years OR for five or more years during their education, and*
- *be entering or attending vocational school, undergraduate school or graduate school.*

In addition to fulfilling the above requirements for the Cornett award, the recipient of the Carol Shuler Memorial Scholarship award must reside in one of the following states: Alaska, Arizona, California, Hawai'i, Idaho, Nevada, Oregon, Utah, or Washington.

Scholarships are awarded based on the following criteria:

- *The recipient has used/uses Cued Speech as primary mode of communication.*
- *The recipient has represented and will continue to represent the NCSA's mission, vision and goals.*
- *The recipient will advocate for the use of Cued Speech for language, learning and literacy.*
- *Two letters of reference (from non-family members) that validate that the use of Cued Speech has increased the applicant's ability to communicate.*

The application is available online at http://www.cuedspeech.org/sub/resources/scholarships.asp. For more information, please contact info@cuedspeech.org.

The deadline for submitting the application for each scholarship is April 1, 2010.

Amity Leitner Graham

September 1, 1973 - August 22, 2009

In August, the National Cued Speech Association learned about the untimely death of Amy Jean Leitner Graham, who was a native cuer. During her college years, she was an active cuer and advocate, as well as a strong proponent for transliteration services. Her parents, Jeanie and Fritz Leitner, were also active in Cued Speech at the local and national levels, and served on the NCSA Board of Directors. We extend our sympathies to Amity's family and friends. You may read her obituary from the Chapel Hill News here (http://www.chapelhillnews.com/sports/story/51821.html).

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On Cue

On Cue, the newsletter of the National Cued Speech Association, is published three times a year; e-mail updates to members are more frequent. Letters to the Editor must include contact information of the author. The Editor reserves the right to select those letters to be published and to edit for length and language. News, calendar items, letters, classified ads, and photos are needed! Electronic transmission of all materials is preferred. Electronic photos must be high-resolution at 300 dpi.

Send to Aaron Rose, Editor, at oncue@cuedspeech.org or mail hard copy to:

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Interested in Becoming a Certified Instructor of Cued Speech?

Take the Basic Instructor Workshop
The BIWS is a two-day intensive workshop taught by two certified and qualified instructors. The workshop covers the standards of cueing mechanics, basic linguistics information, applicable research and the history of Cued Speech, as well as general Deaf Culture information.

Pass the National Certification Exam
You must pass both portions of this exam: 1) an Assessing Cue Errors component and 2) a written component that assesses your knowledge of the material covered during the BIWS.

Demonstrate Proficiency of Cueing Skills
You must pass an approved assessment of expressive cueing skills.

Benefits of Certification
As a certified instructor, you will be listed on our national directory of instructors and be eligible to teach at NCSA-sponsored camps and workshops/events.

Start the process now by registering for the next Basic Instructor Workshop!

NCSA InsCert

For more information, contact Jean Krause at InsCert@cuedspeech.org
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