# Research Supporting the use of Cued Speech and Cued Language

Compiled by Kelly Lamar Crain, Ph.D.
The University of South Florida

CUEDSPEECH
makes spoken language visible

## Topic: The Nature of Cued Speech and Cued Language

### Statement:

While Cued Speech is an effective tool for visually clarifying an auditory message and can improve a child's ability to interpret auditory information received through hearing aids or a cochlear implant, cueing can provide a complete representation of a spoken language regardless of how much a person can or cannot hear (Fleetwood and Metzger, 1997), and it would appear that in at least one case, cueing can even disambiguate phonemic properties of a tonal language such as Thai (Tammasaeng, 1986). It has been shown that deaf cuers of English process much of the linguistic message in a fashion similar to hearing speakers of English, but the visual nature of cueing allows deaf native cuers to process the phonology of English in a way that is unique to them (Koo, 2003).

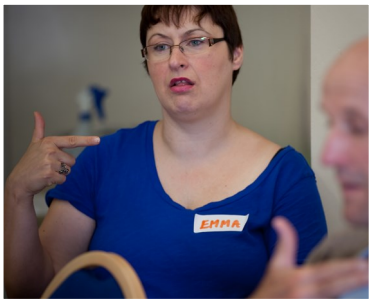
### Research:

**Fleetwood and Metzger (1997)** studied the distinctive features of spoken and cued messages, and concluded that the acoustic properties of the spoken message (for those who can hear it) may at times provide information that supports the visual properties of a cued message, or may at times provide confounding information. The authors conclude that, while Cued Speech was intended by its inventor to be accompanied by an audible spoken message, there is reason to believe that this acoustic information may not be necessary for an individual to receive the full linguistic information conveyed via cueing.

**Tammasaeng (1986)** investigated the effect of Cued Speech on the tonal perception of the Thai language for deaf children in Thailand. Students came from a program using speech with signs, and from a program using signs with fingerspelling, but no speech. All students were taught lipreading skills and Cued Speech for one semester, and were given a test to discriminate pairs of Thai words that differ by tone only. Performance on the test did not vary by program, but did vary by mode of communication, that is the students scored an average of 49.5% with speech alone and an average of 86.2% with the addition of cues. When separating the two groups, the children exposed to speech and then taught to cue scored an average of 96.9%, while the students not exposed to speech and then taught to cue scored an average of 82.6%. The results show that Cued Speech can clarify the tonal characteristics of such a language.

**Koo (2003)** studied the relative contributions of manual and mouth-shape information to the comprehension of a cued message. Koo found that, for a native cuer, a cued message is not 50% handshape (or placement) and 50% mouthshape (or mouth movement), but that cuers use a combination of these incoming signals, with relative weighting of importance. In another study, Koo investigated cuers' ability to use affixes (e.g., word endings), and found that some deaf cuers more consistently apply typical English word endings to psuedowords, suggesting that these cuers have an intrinsic linguistic ability to generate rules regarding nonsense words in the same way that they would apply to real English words.





# Topic: Cued Speech and Speechreading / Lipreading

## Statement:

Deaf cuers are able to perceive and comprehend far more information presented to them via cueing than via speechreading alone (Ling & Clarke, 1975; Clarke & Ling, 1976; Nicholls & Ling, 1982; Gregory, 1987), and there appears to be no support for the opinion that cueing provides a 'crutch' for speechreading, preventing a person from being able to speechread without cues (Ling & Clarke, 1975).

## Research:

**Ling and Clarke (1975)** conducted one of the earliest studies of speechreading ability with Cued Speech. They presented phrases and isolated words, slowly and at a regular speed, via speech alone and via cueing. The children in their study received inconsistent access to cueing and were cued to during in-class instructional times only, and several of the children had already been placed in oral programs, but were considered unable to learn in that setting. Nonetheless, Ling and Clarke found an increase in the amount of information the children could perceive, recode, and recall when presented via cueing, as opposed to speech alone.

**Clarke and Ling (1976)** conducted a follow-up to their 1975 study, and reported that, after one additional year of classroom exposure to Cued Speech, the children's responses gave "a clear indication that cueing facilitated speechreading for sentences, phrases, and words." (p. 30). The authors further stated that "audition [hearing the speech] played no role in speech perception with our subjects" (p. 32), suggesting again that access to 'spoken' language via cueing is not dependent upon a person hearing speech.

**Nicholls and Ling (1982)** studied deaf cueing children's ability to understand speech under seven conditions: 1) audition alone, 2) lipreading alone, 3) audition + lipreading, 4) manual cues alone, 5) audition + manual cues, 6) lipreading + manual cues (i.e., cueing) and 7) audition + cueing. The children were able to recognize over 95% of key words in sentences and over 80% of syllables when the materials were cued to them, higher than in any other condition, with or without audition. This study also supports the idea that, while audition can be very helpful in the reception of a cued message, it is not strictly necessary.

**Gregory (1987)** investigated the speechreading ability of cuers by testing them with and without the addition of cues. Cuers correctly identified almost twice as many single words presented via cues than via speechreading alone. Gregory also found that single words beginning with vowels were more difficult to identify for these cuers than were single words beginning with consonants.

# Topic: Cued Speech and Cochlear Implants

## Statement:

While observational reports from parents and teachers are quite encouraging, research regarding the benefits of Cued Speech specifically in regard to cochlear implants is still minimal. Osberger (1997) reported results of an FDA (United States Food and Drug Administration) clinical trial on the efficacy of cochlear implants for language development in young children, in which children raised with Cued Speech were included as a discrete group. Results from the clinical trial suggested that exposure to Cued Speech provided a benefit pre- and post-implant, as compared to the other groups of children. Vieu, Mondain, Blanchard, Sillon, Reuillard-Artieres, Tobey, Uziel and Piron (1998) studied Cued Speech, Oral, and Signing groups of children at annual intervals post-implantation and found that, while all three groups made progress in speech intelligibility and spoken language ability, the Cued Speech group generally outperformed the other two groups of children. Descourtieux, Groh, Rusterholz, Simoulin and Busquet (1999) discussed a series of case studies of cueing children fitted with cochlear implants that, when considered in sum, suggest that early and consistent access to Cued Speech pre-implantation provides a superior foundation for the acquisition of spoken language after implantation. Cochard, Calmels, Pavia, Landron, Jusson, Honegger and Fraysse (2003) did investigated several auditory, communication, and family-related factors implicated in the development of deaf children who receive cochlear implants, and found many benefits associated with early and clear exposure to Cued Speech.

## Research:

**Osberger (1997)** reported results of an FDA clinical trial, in which 151 profoundly deaf children were followed pre- and post-implantation. The children represented a somewhat homogenous group, in that they all were profoundly, bilaterally (most prelingually) deaf, did not benefit from hearing aids, did not show evidence of mental retardation, and came from homes with spoken English as the primary language. It is important to note that the majority (64%) of the children were implanted by the age of 5 years. The children were categorized as Oral, Cued Speech, or Total Communication. The children raised with Cued Speech represented 13% of the sample, which is a relatively large group.

The efficacy of the cochlear implant was determined by children's awareness of sound (speech and environment) and language development. Therefore, it was necessary to test language abilities and to group children according to communication mode (language access). The Glendonald Auditory Screening Procedure (GASP) and the Early Speech Perception Test (ESP) were used to determine language comprehension. The Cued Speech group's performance (both pre- and post-implantation) was similar to (though slightly higher than) the Oral group, and significantly higher than the Total Communication group. It is important to note that the range of scores for the Cued Speech group was smaller than that of the Oral group, possibly suggesting that Cued Speech was a more significant factor for this group; the Oral group having higher and lower scores, suggesting other variables were significant (depending on the child).

**Vieu, et al. (1998)** investigated speech production of 12 implanted children between the ages of 5 and 9 years old, with an average age of implantation of 7 years, 2 months. This study examined not only pronunciation of single words, but also syntax (grammatical accuracy) of sentences and stages of sentence patterns (language level). Speech intelligibility (words) was tested before implantation, and again at 1, 2, and 3 years post-implantation, by showing children pictures of common objects and having them verbally name the objects (1, 2, and 3 syllable words). Sentence syntax was tested at 1, 2, and 3 years post-implant, by presenting spoken sentences to the children and having them repeat them back completely. Language level was tested at 3 years post-implant, by showing pictures to the children, having them tell stories based on the pictures, and analyzing the accuracy and complexity of the responses.

Results indicated that all children improved their speech production and spoken syntax after implantation, and continued to improve over time (3 years). Specifically, results indicated that the Cued

Speech and Oral groups both outperformed the signing group in word intelligibility and language complexity by the end of 3 years.

**Descourtieux, et al. (1999),** in an attempt to address the issue of whether, "…Cued Speech, which stimulates the visual channel, [would] cease to be useful, perhaps even be contraindicated in the long habilitative process both pre- and post-implant" (p.206), offered a glimpse into the early communication development of four children who received cochlear implants and who were raised with Cued Speech. The authors do not provide specific measures to illustrate receptive or expressive gains experienced by the children in the case studies, but they point out that the common feature of these cases is that the children received a clear visual representation of spoken language prior to implantation, and that their subsequent success with acoustic speech reception must be due, in part, to the visual-acoustic bridge provided by Cued Speech.

**Cochard, et al. (2003)** investigated factors influencing the communication and language development of implanted children, including the role of exposure to Cued Speech. The authors report data on 53 children, who were followed for a number of years in order to document their development. The children were tested regarding auditory discrimination, speech comprehension, spoken intelligibility, and language development.

An important aspect of this study is that the children were separated into three "profiles", depending on their language development progress in the first three years after implantation (i.e. Profile 1: children whose progress is fast and continuous; Profile 2: children whose progress is slower, likely due to being implanted at a later age; and Profile 3: children whose progress is halted, likely due to other family or health factors.) Analyses including all 3 profiles indicate that all children improved in their ability to perceive spoken words and in their own speech intelligibility over time. However, for comparisons of the children's development, only those children who fit the first two profiles are included, and these children are further separated into signing, oral, and Cued Speech groups. Major findings are summarized thus:

Regarding the children's perception of words in open and closed lists, the Cued Speech group outperformed the signing and oral groups at all three time intervals (i.e. 1, 3, and 5 years after implantation).

Regarding the children's speech intelligibility, all children were similar at one year after implantation, but the Cued Speech group outperformed the signing and oral groups at 3 years and 5 years after implantation.

Comparisons of language development were carried out using data from 19 children to whom the authors had consistent access for at least 4 years. Major findings are summarized thus:

Neither age at implantation nor age at the beginning of auditive education appeared to be significant factors of comparison for these groups. This is likely due the children being similar in these regards. A significant difference, however, can be seen regarding a child's ability to benefit from hearing aids prior to implantation. Children who experienced benefit from hearing aids prior to implantation were all found in Profile 1 (progress was fast and continuous) and children who did not benefit from hearing aids prior to implantation were all found in Profile 2 (progress was evident, but slower). Also, most of the children in Profile 1 came from families that reported being comfortable and capable with their communication mode (whether signing, oral, or Cued Speech), and most of the children in Profile 2 came from families that reported being frustrated with their comfort and capabilities. Interestingly, most families in Profile 1 used either oral communication or Cued Speech, whereas most families in Profile 2 used signs with speech.

The authors examined factors related to parents' and families' use of Cued Speech with their children, and results suggest very strongly the importance of early and consistent use of Cued Speech at home and at school. The authors found that parents who attend formal training enjoy more success with Cued Speech, but that the amount of time spent cueing is a more important factor than the actual type of

instruction received. Truly, all families in Profile 1 reported using Cued Speech intensively or regularly, whereas all of the families in Profile 2 reported using Cued Speech regularly, moderately, weakly, or not at all. It is important to note that families in Profile 2 do indeed report success with Cued Speech and/or with the child's cochlear implant, but at a level somewhat lower than the families in Profile 1.

In addition to the aforementioned research currently available, Leybaert (2003) has reported on a series of studies in progress or recently submitted for publication, that look into the contributions of cueing for interpretation of new or degraded auditory input provided by cochlear implants. Preliminary data from de Gestas and Leybaert (in Leybaert, 2003) indicate that, among children receiving cochlear implants, the children with early and consistent exposure to cueing at home and at school, attain rhyme judgment abilities at the expected age, whereas the implanted children who do not cue are slightly delayed in this developmental milestone.

# Topic: Cued Speech and Language Development / Language Processing

## Statement:

Deaf children of hearing parents who cue their native spoken language have been found to develop that language according to the same milestones as hearing peers (Kipila, 1985; Anthony, Moseley, & Williams-Scott, 1991; Metzger, 1994). Hearing parents can learn to cue at a rate and accuracy level sufficient to deliver linguistically complex information to their deaf children within 2-3 months of learning the system (Torres, Moreno-Torres, & Santana, 2006). Deaf children exposed to multiple languages by fluent models of those languages can develop both languages and become bilingual in a fashion similar to hearing children (Earl, 2006). Cueing provides children with access to complete language, including such function words as prepositions, often missed by deaf children from other communication backgrounds (Santana, R., Torres, S., & Garcia, J. (2003**).** Indeed, deaf children whose parents and teachers cue (and/or who work with skilled transliterators) have been found to develop the written forms of spoken languages in ways similar to hearing children of hearing parents (Cornett, 1990; Leybaert & Alegria, 1993; Leybaert, Alegria, & Foncke, 1983; Perier, Charlier, Hage, & Alegria, 1988).

## Research:

**Kipila (1985)** conducted a case study of the expressive and receptive cueing of a 5 year, 4 month old deaf child, and found many morphological structures used with 100% accuracy, including: regular and irregular past, plurals, possessives, and irregular third-person. Structures that Kipila found to be present but at less than 100% accuracy included: articles, contractible copula, present progressive, and regular third person. Many of these have not yet been reached in the 5$^{th}$ year of normal language development.

**Quenin (1993)** examined the effect of Cued Speech on deaf college students' ability to repeat word-for-word what a speaker has said to them. She timed the participant's responses, to keep track of speed as well as accuracy. The participants' reception of connected speech was more accurate and more efficient with cues than without (less errors, and twice as fast). These findings suggest not only the benefit of cueing for receptive language, but specifically the ability of cuers to process ongoing connected discourse.

**Metzger (1994)** conducted a follow-up study with Kipila's (1985) participant at the age of 11 years. Six years after the original case study, Metzger chose to focus on three structures noted by Kipila at 100% accuracy (regular and irregular past tense, and plurals) and three structures noted by Kipila at less than 100% accuracy (the contractible copula, present progressive, and articles). Metzger found all six structures demonstrated at 100% accuracy, suggesting the developmental nature of cued language development similar to the developmental nature of spoken language development.

**Anthony, Moseley, and Williams-Scott (1991)** conducted a case study of the expressive language ability of one child with a severe-to profound hearing loss who was exposed to Cued Speech from the age of 18 months. At the age of 3 years, 10 months, the child was videotaped in interactions with mother, father, and teacher. Language samples revealed evidence of language milestones, including: expressively-cued mean length of utterance (MLU), use of appropriate morphemes, question and negation forms, lexical categories, and turn-taking. The researchers found the participant's morphological, lexical, and pragmatic development to be within normal limits for age level.

**Torres, Moreno-Torres, and Santana (2006)** conducted a case study in Spain involving a prelingually profoundly deaf child, her hearing mother, and a speech-language therapist with 10 years' Cued Speech experience. The girl was identified as deaf at 12 months, and wore bilateral hearing aids until the age of 17 months, at which point she received a cochlear implant. She was exposed to Cued Speech beginning at the age of 14 months. Within 3 months of learning to cue (by the beginning of the

case study), the mother was able to match the therapist's level of cueing (e.g. mean length of utterance, variety and complexity of language forms). Both adults cued 62-65% of language-bearing utterances, and 83% of all words spoken. The child's cued language models provided her access to linguistically rich messages, including nouns, verbs, grammatical structures, and pragmatics. The researchers concluded that the child was provided rich linguistic input via Cued Speech, that a parent can learn to cue and become a sufficiently competent cuer and language model in a short period of time, and that a deaf child can attend to cued as well as oral/aural messages for the purpose of language development.

**Earl (2006)** documented the bilingual development of a ten month old girl with auditory dys-synchrony over a period of 8 months. The girl was exposed to cued Dutch by her hearing mother and cued Spanish by her hearing father. Findings include that, although the girl received fluctuating and inconsistent access to sound and auditory speech information, she demonstrated age appropriate receptive language development in both Dutch and Spanish, and demonstrated comprehension of cued messages in both language whether accompanied by speech or not. The girl's expressive language (primarily spoken) was observed to be approximately 6 months delayed in both Spanish and Dutch, and the researcher speculated that additional disabilities associated with the girl's birth may be contributing factors to this.

**Santana, Torres, and Garcia (2003**), aiming to shed light on deaf children's development of specific linguistic concepts, conducted a study of the acquisition and use of Spanish prepositions by deaf children in Spain form oral, signing, and Cued Speech backgrounds. The researchers chose prepositions due to their important role in the comprehension of spoken language. The results show that the different systems of communication contribute, to different degrees, to the acquisition of Spanish prepositions, with the best results being obtained with Cued Speech. In the study, 35 children with prelingual profound sensorineural bilateral hearing loss who could read at a measured age equivalent of at least 8 years were grouped according to whether they had been consistently exposed (for at least the last 3 consecutive years) to oral, signed, or cued communication. The children were presented with a task booklet made of sheets with simple sentences from which the preposition had been replaced by a blank and four prepositions from which to choose a response. Each sentence was accompanied by a drawing to help clarify the meaning of the sentence. Results indicated no significant difference between the Cued Speech group and a hearing control group. These scores were higher than those seen in both the oral and signing groups. The authors conclude that exposure to cued language supplies information about the prepositions of spoken language to deaf children commensurate with that supplied to hearing children by speech.

# Topic: Cued Speech and Phonics / Spelling

## Statement:

Deaf children with early and consistent exposure to cueing develop a phonological representation of words in their language, and can learn phonics generalizations for spelling in the same way as hearing children who speak the language (Alegria, Dejean, Capouillez & Leybaert, 1990; Leybaert & Charlier, 1996; Leybaert & Lechat, 2001).

## Research:

**Alegria, Dejean, Capouillez, & Leybaert (1990)** compared hearing students and deaf cuers on the ability to identify new words in print. The students were first given a pre-test to determine words familiar and unfamiliar to them, and then they participated in mini-lessons in which they learned new vocabulary words, presented in cued French and accompanied by pictures instead of written words. After each lesson, the children were shown the drawings again and were given a multiple-choice test, consisting of both familiar and unfamiliar words. For each picture, one written word was the correct choice, two written words visually similar to the correct choice when speechread, and one written word was unrelated. In order for children to choose the correct word, they would have to disregard the both choices that look the same on the mouth and choose the one that is exactly the same when cued. There was a significant increase in correct responses for the new words, even though the children only had exposure to cued representations of the words, and no exposure to the printed word. These findings suggest that exposure to Cued Speech can provide children with the phonological representations of words, and the ability to develop their own vocabularies based on words' phonological structure.

**Leybaert and Charlier (1996)** compared the phonics abilities of hearing students, deaf students who were exposed to Cued Speech at home and at school, those who were exposed to Cued Speech at school, using a generative spelling task. The students were shown simple pictures and were asked to spell the words represented. The deaf students exposed to Cued Speech at home plus at school, like the hearing students, exhibited error patterns in which the majority of errors were phonologically accurate (i.e., could be pronounced like the correctly spelled word). This was in sharp contrast to the students who were exposed to Cued Speech at only at school only, whose errors were almost equally phonologically accurate and phonologically inaccurate. These findings strongly argue for the use of Cued Speech at home plus at school for the development of cued language.

**Leybaert and Lechat (2001)** conducted a study of prelingually, profoundly deaf children's spelling skills, in order to determine whether a deaf child's accuracy in the use of phonics knowledge is affected by: (a) the nature of linguistic experience; (b) the age at which language exposure began; or (c) an interaction of the two factors. Signing children and cueing children were given picture and/or short sentences and asked to write a missing (but familiar) word. Specific phonics rules were investigated, to determine the accuracy of children's spelling based on phonics. Both groups of signing children (those exposed to sign and/or a signed language at school and/or at home) provided more phonologically inaccurate spelling errors than phonologically accurate ones. The children exposed to cueing at home and at school provided more phonologically accurate spellings, and showed differences in spelling based on phonics generalizations, suggesting the importance of early acquisition of a language that has the phonological structure for the development of accurate phonics representations for spelling.

# Topic: Cued Speech and Memory for Reading

## Statement:

Deaf children with early and consistent exposure to cueing at home and at school demonstrate word coding, memory, and reading abilities similar to hearing peers, and superior to deaf children from other communication backgrounds (Leybaert & Charlier, 1996; Wandel, 1989; Ketchum, 2001) **AND** superior to children exposed to cueing only at school (Leybaert & Charlier, 1996).

## Research:

**Leybaert and Charlier (1996)** compared deaf children raised orally, those raised with cueing at home and at school, and those raised with cueing only at school on their use of phonological representations (the way a word is "said") for remembering a series of words. Picture stimuli were used to avoid the possibility of giving the children pronunciation clues based on spelling. The three groups were asked to recall series of pictures representing words in two sets of conditions: 1) rhyming vs. non-rhyming and 2) one-syllable vs. multiple syllables. The hearing children and the children who were exposed to cueing both at home and at school were able to recall more words than the oral group, and showed a difference in their ability to remember words based on word length and on phonological similarity (it's harder to remember a list of words if they rhyme, and it's harder to remember a list of long words than short words) suggesting that the children exposed to Cued Speech both at home and at school process the phonological structure of spoken words in much the same way as hearing children.

**Wandel (1989)** matched groups of deaf elementary school students by communication mode (Oral, TC, and Cued Speech) and compared them to a hearing control group matched for age, gender, and cognitive ability. Results indicated that the TC sub-groups had the lowest measured achievement on the tasks and the lowest internal speech recoding ability. There was no significant difference in reading achievement between the hearing and Cued Speech-profound groups. There was a relationship between internal speech recoding and reading comprehension for the deaf subjects in her study, and it seems that cuers use internal speech better than users of MCE systems.

# Topic: Cued Speech and Phonological Representations for Reading

## Statement:

Individuals with early and consistent exposure to cueing in childhood demonstrate an awareness of phonology and reading comprehension commensurate with hearing peers (Coryell, 2001; LaSasso, Crain, & Leybaert, 2003). Children exposed to cued French demonstrate rhyme judgment and rhyme generation abilities similar to hearing peers, (Charlier & Leybaert, 2000), as do children exposed to cued American English (Crain, 2003).

## Research:

**Charlier and Leybaert (2000)** studied the generative rhyming abilities of deaf children exposed to signing at school or at school plus at home, and deaf children exposed to cueing at school or at school plus at home. The children were asked to think of and write down words to rhyme with either printed words or the words indicated by pictures. Target words were separated into two groups: 1) easier words, in which correct rhyming answers are spelled alike, and 2) more difficult words in which correct rhyming answers may or may not be spelled alike. The group of children exposed to Cued Speech both at home and at school performed similarly to the hearing control group, outperforming all of the other groups.

**Coryell (2001)** investigated the correlation between verbal sequential processing abilities and reading abilities of deaf participants from signing and cueing backgrounds, compared to a hearing control group. Participants were tested with measures of verbal sequential processing, passage reading comprehension, and intellect. The deaf participants who used sign communication showed comparable intellect, yet scored lower than the cueing participants and the hearing controls, both on measures of verbal sequential processing and measured reading comprehension. Coryell hypothesized that the signers' over-reliance on top-down reading processes may contribute to a lesser ability to take advantage of verbal sequencing for reading comprehension.

**LaSasso, Crain, & Leybaert (2003)** compared the rhyme generation abilities of hearing young adults to young adults with severe to profound deafness from 1) cueing backgrounds and 2) non-cueing backgrounds. Rhyming accuracy was better for orthographically-and-phonologically consistent words than for orthographically-and-phonologically inconsistent words. The performance of the deaf participants from cueing backgrounds did not differ significantly from that of the hearing participants. However, the performance of the non-cueing group was well below that of the hearing group. Hearing and cueing participants produced more orthographically different responses (e.g., *love* and *of*) while participants from the non-cueing group produced more responses that are orthographically similar (e.g., *love* and *glove*), indicating that the hearing and cueing groups rely more on phonology and the non-cueing group more on spelling to generate rhymes. Between-group comparisons reading comprehension scores indicated comparable measured reading achievement for the three groups, but within-group correlations between reading score and proportion of orthographically different responses indicated a correlation between measured reading achievement and rhyming ability. These findings point to the connection between phonological awareness and reading achievement.

**Crain (2003)** compared the effect of exposure to cued American English by comparing the generative rhyming abilities and reading comprehension of 10-14 year old deaf children from oral and cueing English-language backgrounds. He found that although the oral group had higher levels of hearing and better ratings of speech intelligibility than the cueing group, the cueing group had superior phonological awareness (PA) and higher measured reading comprehension, despite having more profound degrees of deafness. Additionally, speech intelligibility and degree of deafness correlated to PA for the oral group (i.e., the lower the speech intelligibility, the lower the PA; the less hearing, the lower the PA), but this was not true of the cueing group. This suggests that exposure to cued American English provides children with an internal representation of English that is sufficient to aid in their normal reading development, and that need not be affected by degree of deafness or speech capabilities.

# References


Alegria, J., Charlier, B., & Mattys, S. (1999). The role of lip-reading and Cued Speech in the processing of phonological information in French-educated deaf children. *European Journal of Cognitive Psychology*, 11, 451-452.

Alegria, J., Dejean, K., Capouillez, J., & Leybaert, J. (1990). Role played by Cued Speech in the identification of written words encountered for the first time by deaf children. *Cued Speech Journal*, 4, 4-9.

Anthony, C., Moseley, M., & Williams-Scott, B. (1991). Language expressed through Cued Speech: A preschool case study. Paper presented at the *American Speech and Hearing Association*, Atlanta, GA. Nov. 1991.

Charlier, B. & Leybaert, J. (2000). The rhyming skills of deaf children educated with phonetically augmented lipreading. *Quarterly Journal of Experimental Psychology*, 53A, 349-375.

Clarke, B. & Ling, D. (1976). The effects of using Cued Speech: A follow-up study. *The Volta Review*, 78, 23-34.

Cochard, N., Calmels, M., Pavia, G., Landron, C., Husson, H., Honegger,A., & Fraysse, B. (2003). L'impact du LPC sur l'évolution des enfants implantés. *Unité Pédiatrique d'Implantation Cochléaire*. Downloaded 1/3/06 from http:// www.alpc.asso.fr/rech01-a.htm

Coryell, H. (2001). Verbal sequential processing skills and reading ability in deaf individuals using Cued Speech and signed communication. *Unpublished Doctoral dissertation*, Gallaudet University, Washington, DC.

Crain, K. (2003). The development of phonological awareness in moderately-to-profoundly deaf developing readers: The effect of exposure to cued American English. *Unpublished Doctoral Dissertation*. Gallaudet University, Washington, DC.

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*, 47,205-207.

Earl, P. (2006). Communication Behaviors of a Young Child with Auditory Dys-Synchrony: Seeing Cued Dutch and Cued Spanish. *Unpublished Doctoral Dissertation*, University of Cincinnati, Cincinnatti, OH.

Fleetwood, E. & Metzger, M. (1997). Does Cued Speech entail speech? An analysis of cued and spoken information in terms of distinctive features. *Unpublished manuscript*.

Gregory, J. (1987). An investigation of speechreading with and without Cued Speech. *American Annals of the Deaf*, 132 (6), 393-398.

Ketchum, K. (2001). Implications of working memory strategies in deaf native cuers, hearing cuers, and hearing non-cuers. *Unpublished doctoral dissertation*, Gallaudet University, Washington, DC.

Kipila, B. (1985). Analysis of an oral language sample from a prelingually deaf child's Cued Speech: A case study. *Cued Speech Annual*, 1, 46-59.

Koo, D. (2003). On the nature of phonological representations and processing strategies in deaf cuers of English. *Unpublished Doctoral Dissertation*, The University of Rochester, Rochester, NY.

LaSasso, C., Crain, K. & Leybaert, J. (2003). Rhyme generation in deaf adults: The effect of exposure to Cued Speech. *Journal of Deaf Studies and Deaf Education*, 8 (3), 250-270.

Leybaert, J. (2003). Phonological Representations in Profoundly Deaf Children with a Cochlear Implant: Possible Benefits from Exposure to Cued Speech. *Presentation given October 12*, 2003 at Gallaudet University: Washington, DC.

Leybaert, J. & Charlier, B. (1996). Visual speech in the head: The effect of Cued Speech on rhyming, remembering, and spelling. *Journal of Deaf Studies and Deaf Education*, 1, 234-248.

Leybaert, J. & Lechat, J. (2001). Variability in deaf children's spelling: the effect of language experience. *Journal of Educational Psychology*, 93, 554-562.

Ling, D. & Clarke, B. (1975). Cued Speech: An Evaluative Study. *American Annals of the Deaf*, 120 (5), 480-488.

Metzger, M. (1994). Involvement strategies in cued English discourse: Soundless expressive phonology. *Unpublished manuscript*, Georgetown University, Washington DC.

Nicholls, G. & Ling, D. (1982). Cued Speech and the reception of spoken language. *Journal of Speech and Hearing Research*, 25, 262-269.

Osberger, M. (1997). Current issues in cochlear implants in children. *The Hearing Review*, 4 (10), 28-31.

Quenin, C. (1992). Tracking of connected discourse by deaf college students who use Cued Speech. *Unpublished Doctoral Dissertation*, The Pennsylvania State University.

Santana, R., Torres, S., & Garcia, J. (2003). The role of Cued Speech in the development of Spanish prepositions. *American Annals of the Deaf*, 148, 323-332.

Tammasaeng, M. (1985). The effects of cued speech upon tonal perception of the Thai language by hearing impaired children. *Unpublished Doctoral Dissertation*, Gallaudet University, Washington, DC.

Torres, S., Moreno-Torres, I., & Santana, R. (2006). Quantitative and qualitative evaluation of linguistic input support to a prelingually deaf child with Cued Speech: A case study. *Journal of Deaf Studies and Deaf Education*, 11, 438-448.

Vieu, A., Mondain, M., Blanchard, K., Sillon, M., Reuillard-Artieres, F., Tobey, E., Uziel, A., & Piron, J. (1998). Influence of communication mode on speech intelligibility and syntactic structure of sentences in profoundly hearing impaired French children implanted between 5 and 9 years of age. *International Journal of Otorhinolaryngology*, 44, 15-22.

Wandel, J. (1989). Use of internal speech in reading by hearing and hearing-impaired students in oral, total communication and Cued Speech programs. *Unpublished doctoral dissertation*, Teachers College, Columbia University, New York, NY.

Made available by the Cued Speech Association UK
Email: info@cuedspeech.co.uk
Web:www.cuedspeech.co.uk
Phone (voice and text): 01803 83 27 84

## For training and more information about the use of Cued Speech contact:

Cued Speech Association UK (CSAUK),
9 Jawbone Hill, Dartmouth, Devon, TQ6 9RW
Tel: 01803 832784
Email: info@cuedspeech.co.uk
Webs: www.cuedspeech.co.uk &
www.learntocue.co.uk

Health & care information you can trust
The Information Standard Certified Member

CSAUK is a national charity run by users of Cued Speech (both professionals and parents).
CSAUK - making spoken language visible v1 2014