

Cued Speech Research

There is a wide body of research that demonstrates the effectiveness of Cued Speech in many different areas. A fraction of this research is summarised here.

Lip-reading

When the lip-patterns of speech are supplemented by the handshapes and positions (cues) of Cued Speech the research below shows that deaf children are able to see the phonemes (sound-based units) of speech with 96% accuracy. The graph opposite shows that, whilst these deaf children can understand very little by listening alone and less than 50% through lip-reading and listening combined, they can understand a staggering 96% with the addition of Cued Speech.

Graph to go here

Nicholls, G. (1979), 'Cued Speech and the Reception of Spoken Language.' Master's Thesis, McGill University, Montreal, (available from Gallaudet University). Summary, co-authored by Dr. Daniel Ling, published in the Journal of Speech and Hearing Research, 25, 262-269, Nicholls, G. and Ling, D. (1982)

Once every phoneme (sound-based unit) of speech is made visible the research below and overleaf shows that deaf children can develop receptive and expressive language which is comparable to that of hearing children. With the vocabulary and structure of spoken language in place the research on pages 3 and 4 demonstrates the fact that deaf children are in a strong position to become fully literate, to effectively use their residual hearing and to lip-read with greater accuracy than those who do not cue.

In Spain the Complemented Oral Model (Modelo Oral Complementada, MOC) has been running for 12 years and uses Cued Speech within an oral programme. It is the result of collaboration between six professors from the University of Malaga and the region's Education Department.

Based on extensive research, the scientific conclusions of the group are:

'Linguistic development: study of 6 specific aspects (vocabulary, form, number, prepositions, verbs and pronouns) has demonstrated that children supported by Cued Speech use oral and written language with the same precision as their hearing peers. Furthermore their written texts contain more vocabulary and evidence of a greater command of morphology and syntax than those of their hearing peers at ten years old. The objective of converting the prelingually deaf child to 'autonomous learner', through reading and writing, has been achieved.

'Perception of speech: through the use of Cued Speech, the deaf child (from babyhood) can visualise speech.

'Cognitive development: various tests including those of memory and phonics demonstrate that children attain good phonological production (both speech and written language) and also that they put their knowledge to use in cognitive processes and tasks at a high level, such as memory and reading comprehension.

'The outcomes demonstrate that the early and systematic use of Cued Speech has allowed the 4 key problems of the education of deaf children to be resolved:

clear and distinct spoken language can be perceived at a very early age
the family network can be used to ensure quality linguistic development
reading can be accessed through phonology and
oral language development takes place through the natural route.

Professor Santiago Torres (University of Malaga) María José Ruiz Casas (University of Malaga). Summary prepared from Spanish by Anne Worsfold and Professor Torres with grateful thanks to Maureen Brenton. For academic references see www.uma.es/moc

Expressive and Receptive Language

Marilyn Peterson, on the basis of research data on 36 profoundly deaf children 5 to 11 years old, stated: "It is very apparent to me that deaf children receiving Cued Speech surpass the majority of signing and oral children [using only amplified sound] in verbal language skills."

Three different tests were used to measure proficiency in the English language: an informal question test; the Maryland Syntax Evaluation Instrument, (MSEI); and the Expressive One Word Picture Vocabulary Test, (EOWPVT). The results were as follows:

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Question Test	EOWPVT	MSEI
6/7 (86%) of the cuers	4/5 (80%) of cuers	5/7 (71%) of cuers
1/8 (13%) of oral	2/9 (22%) of oral	1/9(11%) of oral
3/18 (17%) of signers	2/20(10%) of signers	1/20(5%) of signers

**Peterson, M. (1991), Data on language of profoundly deaf children with oral, signing and Cued Speech backgrounds. Unpublished data supplied by correspondence to R.O. Cornett and summarised in Cornett & Daisey's 'The Cued Speech Resource Book' (pp 697-699), 1992. National Cued Speech Association, Raleigh, NC, USA.*

Research by Berendt et al with children who were severely or profoundly deaf, between the ages of 5 to 16, and who had used Cued Speech for two years or more found that:

- 1) The average Cued Speech subject scored better than 92% of hearing-impaired children generally using the Rhode Island Test of Language Structure (RITLS) for receptive language.
- 2) Cued Speech children produced correct sentences with essentially the same frequency as hearing children, using the Developmental Sentence Score (DSS) test for expressive language.

Children introduced to Cued Speech before the age of 2 scored significantly better than those who began later. However, in part this reflects the simple fact that the early starters had been exposed to Cued Speech longer.

**Berendt, H., Krupnik-Goldman, B., & Rupp, K. (1990), 'Receptive and expressive language abilities of hearing-impaired children who use Cued Speech.' Master's Thesis, Colorado State University, Fort Collins, CO, USA.*

Finally, French research shows that Cued Speech enables deaf children to understand spoken language better than with lip-reading alone. With parents cueing, the gain is greater than with cueing only at school. Greatest gain is with cueing both at home and at school.

**Perrier, O., Charlier, B., Hage, C., & Alegria, J. (1987), 'Evaluation of the Effects of Prolonged Cued Speech Practice upon the Reception of Spoken Language.' In I.G. Taylor (Ed.) 'The Education of the Deaf - Current Perspectives,' Vol. 1, 1985 International Congress on Education of the Deaf, Beckenham, Kent, UK. Croom Helm Ltd. (Reprinted in the Cued Speech Journal, 4, 1990).*

Cued Speech with sign language

In this study, which looks at the use of Cued Speech together with signed French, Cued Speech was found to improve spoken language acquisition in young deaf children when used in combination with sign language. Parents used both signed French and Cued Speech. Highly revealing are the speech samples of Sacha, between the ages of four and five, and the experience of his parents as their ability with signs was outdistanced by his linguistic progress, causing them to shift gradually to the almost exclusive use of Cued Speech.

**Perrier, O., Bochner-Wuidar, A., Everarts, B., & Michiels, J., (1986), 'The Combination of Cued Speech and Signed French to Improve Spoken Language Acquisition by Young Deaf Children,' in B. Tervoort (Ed.) 'Signs of Life: Proceedings of the Second European Congress on Sign Language Research' (pp 194-199), Amsterdam. Reprinted in the Cued Speech Journal, 4, 1990.*

Reading and Listening

Reading

The original impetus behind Cued Speech was to improve the literacy levels of deaf students and it has been found to be uniquely successful.

Profoundly deaf children with whom Cued Speech is used can achieve reading scores equivalent to hearing children.

Research by Jean Wandel in 1989 found that profoundly deaf students with whom Cued Speech was used were found to read as well as their hearing peers and better than similarly impaired children educated without cueing in oral or in total communication programs.

**Wandel, Jean E. (1989), 'Use of Internal Speech in Reading by Hearing and Hearing Impaired Students in Oral, Total Communication, and Cued Speech Programs.' Unpublished Doctoral Dissertation, Teacher's College, Columbia University, New York.*

Belgian research by Alegria et al looks at the way in which Cued Speech improves reading. It does so by allowing deaf children with whom Cued Speech is used to acquire a knowledge of the sounds within words. When reading, they can use this knowledge to 'sound-out' words they do not know in the same way as hearing children.

**Alegria, J., Lechat, J. & Leybaert, J. (1988), 'Rôle du LPC dans L'Identification de Mots chez L'Enfant Sourd: Theorie et données préliminaires' [Rôle of Cued Speech in the Identification of Words in the Deaf Child: Theory and Preliminary Data]. Glossa, 9, pp36-44 (Reprinted, Cued Speech Journal, 4, 1990).*

Further research shows that Cued Speech develops, in a deaf child, an internal phonological model of the spoken language that can prime the whole process of reading acquisition.

**Alegria, J., Dejean, C., Capouillez, J.M., & Leybaert, J. (1989, May), 'Role Played by the Cued Speech in the Identification of Written Words Encountered for the First Time by Deaf Children.' Presented at the annual meeting of the Belgian Psychological Society, Louvain-la-Neuve. (Reprinted in the Cued Speech Journal, 4, 1990).*

1996 research demonstrated that deaf children exposed to Cued Speech at home at an early age rely on inner speech for rhyming, remembering, and spelling similarly to hearing children but differently from deaf children not exposed early to Cued Speech.

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, Vol. 1, pp. 234-248.

Phonological awareness, which can be assessed by the ability to recognise rhymes, is important for literacy and is an area where deaf children traditionally, and not surprisingly, have had difficulties.

The study, *Rhyme Generation in Deaf Students: The Effect of Exposure to Cued Speech*, compared the rhyming abilities of deaf children with a Cued Speech background (CS) and deaf children without the benefit of Cued Speech (NCS) with a control group of hearing children. It found that 'the performance of the deaf participants from CS backgrounds, although falling between that of the hearing and the NCS groups, did not differ significantly from that of the hearing group'.

Carol LaSasso and Kelly Crain, Gallaudet University and Jacqueline Leybaert, Free University of Brussels, published in Journal of Deaf Studies and Deaf Education Vol. 8 no. 3 Oxford University Press 2003.

Listening

Soon after Cued Speech was devised it became apparent that it enabled deaf children to 'see' all the sounds of speech with great accuracy.

In 1984 it was suggested that there was a possible danger that deaf children who have the benefit of a superior visual way of understanding may fail to use their residual hearing to the full. The French research below showed that the opposite was the case and that in fact 'the use of Cued Speech improved the use of audition and did not divert the auditory attention of deaf children'.

**Charlier, B.L. & Paulissen, D. (1986), 'Audiometric Vocale et Langue Parlé Complété (L.P.C.).' Speech Audiometry and Cued Speech Otica, 10, p19.*

There have been a number of studies which show that the use of Cued Speech can help hearing and deaf people with a second spoken language. The research below details how Cued Speech can help foreign dialect students to improve their abilities to discriminate English vowels auditorily.

*Chapman, I.M. (1984), 'The Effects of Cued Speech on the Auditory Discrimination of English Vowels by Hearing Chinese Speakers.' Unpublished Master's Thesis, University of Mississippi.

Other Research

Lip Reading

Cued Speech is shown to improve lip-reading of profoundly deaf students.

The graph below shows how twelve children who were considered to be oral failures improved their lip-reading and reception of all words in sentences both immediately and over time.

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*Clarke, B. & Ling, D. (1976), 'The Effects of Using Cued Speech: A Follow-up Study', *The Volta Review*, 78, pp23-24.

Further research by Kaplan showed that Cued Speech significantly improved speechreading abilities of prelingually deaf persons.

*Kaplan, J. (1974), 'The effects of Cued Speech on the speechreading ability of the deaf.' Unpublished Doctoral Dissertation, University of Maryland.

Two other pieces of research showed that Cued Speech instruction improved the speech-reading ability of hearing subjects.

Chilson, R.F. (1979), 'Effects of Cued Speech on Lip-reading Ability.' Unpublished Master's Thesis, University of Rhode Island. AND: Neef, N. & Iwata, B. (1985), 'The Development of Generative Lip-reading Skills in Deaf Persons Using Cued Speech', in *Analysis and Intervention in Developmental Disabilities*, Vol. 5, pp. 289-305.

Cochlear Implantation

Cued Speech provides a deaf child with a sound-based model of spoken language through the medium

of vision. This matches the information which the child can hear post-implant.

Results obtained by the following research suggest that: 'The more the young child has developed oral communication via the visual channel (Cued Speech) prior to implantation, the more the analysis of phonetic and linguistic elements by auditory means will occur rapidly after implantation.'

*Descourtieux, C., V. Groh, A. Rusterholtz, I. Simoulin, D. Busquet, 'Cued Speech in the Stimulation of Communication: An Advantage in Cochlear Implantation.' Published in *The International Journal of Paediatric Otorhinolaryngology*, No 27, 1999.

Further research shows that 'Children's use of Cued Speech prior to cochlear implantation has a significant positive effect on ability to benefit from the implant.'

Osberger, M.J., 'Current Issues in Cochlear Implants in Children.' (1997, October), *The Hearing Review*, pp. 28-31.

Speech

This paper demonstrates how Cued Speech with signed French can trigger speech.

*Perrier, O. (1987, October), 'The Psycholinguistic Integration of Signed French and Cued Speech: How can Speech Components be Triggered?' Paper presented at the Symposium on Oral Skills and Total Communication, Gent, Belgium. (Reprinted in the *Cued Speech Journal*, 4, 1990).

Cued Speech is also shown to help deaf and hard of hearing college students learn Spanish and French.

Bement, L. & C. Quenin. (1998), 'Cued Speech as a Practical Approach to Teaching Spanish to Deaf and Hard of Hearing Foreign Language Students.' *Cued Speech Journal*, Vol. 6, pp.40-56.

Cued Speech with deafblind people

Research into the use of Cued Speech as a supplement to the Tadoma Method resulted in nearly perfect discriminability of both vowel and consonant pairs using tactual reception of the manual cues

associated with Cued Speech.

**Reed, Rabinowitz, Durlack, et al. (1992), 'Analytic Study of the Tadoma Method: Improving Performance Through the Use of Supplementary Tactual Displays' Journal of Speech and Hearing Research, Vol. 35, pp450-465, April 1992.*