

Can explicit training in Cued Speech improve phoneme identification?

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Abstract

Introduction: When identifying phonemes in new spoken words, lipreading is an important source of information for many deaf people. Because many groups of phonemes are virtually indistinguishable by sight, deaf people are only able to identify about 30% of phonemes when lipreading nonwords. Cued Speech (CS) is a system of handshapes and hand positions used alongside speech to disambiguate similarities in lip patterns. Deaf children exposed to CS from under 3 years of age go on to develop age-appropriate language and literacy skills (Colin, Leybaert, Ecalle, & Magnan, 2013; Crain & LaSasso, 2010; Leybaert, 2000; Rees & Bladel, 2013). However, there are no studies evaluating the explicit training of CS with older deaf children. This study is the first part of a long-term project to develop and evaluate a computer-delivered programme to teach school-aged deaf children to recognise cued phonemes.

Aim: The main aim of this study was to investigate whether one 45-minute session of CS training would increase the ability of hearing adults to identify phonemes in cued nonwords presented without sound.

Method: Sixty two adult hearing participants completed a single training session and were randomly assigned to one of three training conditions: Cued Speech Training (CST), Lipreading Training (LT) and Auditory Training in Noise (AT). This ensured that any improvements resulting from the CST could not be explained solely by lipreading practice or familiarisation with a closed set of phonemes. All participants were all tested on their ability to identify 13 phonemes in 32 Consonant-Vowel-Consonant nonwords when denied access to sound before and after the training sessions. Half of the nonwords were used in the training.

Results: Two one-way ANOVAs were performed in order to establish whether the performance of the groups undergoing the three training conditions differed before and after training in response to the cued nonwords. There was no significant difference in performance between groups before training.. Post hoc tests (Tukey's HSD; $p < .05$) revealed that the scores of the group who received CST were significantly higher than those of both the LT and AT groups. To establish whether the increase in identification accuracy in the group who had received CST could be generalised to cued nonwords not included in the training programme, we conducted an additional paired comparison on just the untreated

cued nonwords for the CST group, comparing before and after training, finding a significant increase in identification accuracy.

Conclusions: The CST group made highly significant improvements in identifying cued phonemes and these changes could not be explained by lipreading practice or familiarisation with a closed set of phonemes. Improvements generalised to nonwords that were not used in training.

Implications: Findings suggest that it is possible to train those with no or limited hearing to benefit from the addition of CS when identifying phonemes in new words.

Impact: The late learning of CS could help deaf children to identify phonemes in new words and store them accurately in their lexicon. This could potentially improve their language and literacy skills.

References

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