

The impact of the Speech Systems Approach on intelligibility for children with cerebral palsy: a secondary analysis

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Disclosure of interests of authors

Full disclosure of interests: Completed ICMJE forms for all authors, including all related interests, or available in the tool kit on the NIHR journals Library report publication page at <https://doi.org/10.3310/EDAE1779>.

Primary conflict of interest: Stuart Cunningham is a named inventor of speech recognition technology which is licensed by the co-owner of the intellectual property, The University of Sheffield to Therapy Box Ltd. Therapy Box Ltd are developers of software for speech and language therapy, communication and education.

Published September 2023

DOI: 10.3310/EDAE1779

Plain language summary

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Efficacy and Mechanism Evaluation 2023; Vol. 10: No. 4

DOI: 10.3310/EDAE1779

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Plain language summary

Some children with cerebral palsy have speech that sounds weak, slurred and difficult to understand, which seriously impacts their social life and education. We developed a therapy programme to help children control their breathing and how fast they speak. Having more breath should make children's voices stronger. Speaking at a steady rate should give enough time for children to move their jaw, tongue and lips to produce each sound more precisely. Children's speech was easier to understand after the therapy. This study aimed to find out if the therapy worked by helping children to say consonant sounds more clearly.

We used recordings made in previous research to work out which consonants listeners heard correctly. We also looked at waveforms, which showed children's speech as moving pictures, to find out how speech changed.

After therapy, when children spoke in single words, listeners heard almost all types of consonant sounds at the start and end of words more clearly. No particular type of consonant sounds, such as 's' in 'so' or 't' in 'tar', led to better speech clarity. Waveforms showed that some children produced stronger speech sounds, some slowed their speech, and some did both.

Listeners heard some children more clearly after therapy when they spoke in phrases, but found others more difficult to understand. Few consonants were easier to understand after therapy. We saw no clear patterns of change in speech waveforms.

Overall, children produced stronger, more precise speech in single words, but not all transferred this skill to speaking in phrases. Children differed in how they achieved clearer speech.

We used the findings to refine the therapy to focus on phrases early in the programme and to personalise instructions to children's individual speech patterns. We will use waveforms to find where children have most difficulty and to measure improvement.

Efficacy and Mechanism Evaluation

ISSN 2050-4365 (Print)

ISSN 2050-4373 (Online)

Efficacy and Mechanism Evaluation (EME) was launched in 2014 and is indexed by Europe PMC, DOAJ, Ulrichsweb™ (ProQuest LLC, Ann Arbor, MI, USA) and NCBI Bookshelf.

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The EME programme is funded by the Medical Research Council (MRC) and the National Institute for Health and Care Research (NIHR), with contributions from the Chief Scientist Office (CSO) in Scotland and National Institute for Social Care and Health Research (NISCHR) in Wales and the Health and Social Care Research and Development (HSC R&D), Public Health Agency in Northern Ireland.

This report

The research reported in this issue of the journal was funded by the EME programme as project number NIHR130967. The contractual start date was in November 2020. The final report began editorial review in May 2022 and was accepted for publication in November 2022. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The EME editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

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