



NSW Speech Pathology Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE: Non-stimulable phonemes should be prioritised over stimulable phonemes when treating phonological impairment of unknown origin in children, as non-stimulable sounds are least likely to be acquired without intervention. Study suggests that stimulability for a sound may indicate it is being acquired naturally.

Clinical Question [patient/problem, intervention, (comparison), outcome]: In children with a phonological impairment of unknown origin, are intervention gains more widespread and efficient if stimulable or non-stimulable phonemes are targeted during phonologically based intervention?

Search Terms:

Search Systems: article suggested by an academic specialising in speech sound disorders in children.

Citation: Miccio, A. W., Elbert, M., Forrest, K. (1999). The Relationship Between Stimulability and Phonological Acquisition in Children With Normally Developing and Disordered Phonologies. American Journal of Speech-Language Pathology, vol. 8, 347-363.

Design: Single-subject research methodology: Multiple baseline design across subjects. Subjects were part of a larger study on the acquisition of voiceless fricatives.

Participants: Two groups of 4 children. One group with normal phonology (3.6 – 4.1yrs), and one group with disordered phonology (3.10 – 5.7yrs). All children had normal hearing, language and cognition, & spoke English only. Phon disordered group had, at least 6 sounds in error across 3 manner classes, GFTA score at or below 5th percentile. at least 4 sounds in error acquired by 75% of peers. at least 2 fricatives absent from their inventory.

Experimental Group: Children in the phonologically impaired group were split into 2 pairs. One child of each pair was treated, while the other acted as a control. The control child started Rx after the first child showed 20% improvement from baseline or once 5 weeks had lapsed. One non-stimulable fricative was targeted. The intervention involved: production of target sound in isolation, followed by CV nonsense syllables, and 5 minimally paired words

contrasting the target sound with the error sound. Rx conducted twice weekly for 45 minutes. 20 sessions was the maximum offered. **Control Group:** 4 typically developing children with at least 2 voiceless fricatives absent from inventory. Stimulability probe was administered at the beginning of the study (ie month 1), and on termination of Rx.

Results: All 4 children who received intervention targeting non-stimulable fricatives, *acquired untreated stimulable phonemes* by followup, and increased their total number of stimulable phonemes. Three of these four children also *acquired the targeted non-stimulable fricatives*. Children with typically developing phonologies acquired stimulable sounds within a few months of their identification. All the children in the study had acquired all stimulable sounds within 5 months of the initial probe. There was a general trend in the treatment group where stimulable sounds were those most likely to be acquired by the next analysis, and those sounds that were phonetically related to the treatment sound (ie the fricative in this case) are most likely to become stimulable.

Comments on Design: Small number of children, but the design seemed appropriate to address the hypotheses under investigation. Several methods of control were employed. It would have been helpful to know if participants generalised changes at single-word level to conversational speech.

Level of Evidence (NH&MRC): Level IV. (Note: Single-subject design with control seemed adequate.)

Appraised By: EBP Paediatric Speech Group

Date: March 2004

Guidelines for completion of the CAP

Clinical Bottom Line

The consensus of the reviewers on implications of the paper on clinical practice. Whilst this may be somewhat subjective, it is hoped that robust discussion, the Level of Evidence and your comments on the design will enable you to produce a practical/realistic 'bottom line'. Many of the papers in Speech Pathology may have limitations, but the Clinical Bottom line should be aimed to help clinicians apply what evidence there is.

Clinical Question

This should ideally include four components:

- the patient or problem
- the intervention (or diagnostic test or prognostic factor)
- the comparison intervention or test (*optional*)
- the outcome

Design

Refer to pages 12 to 15 of the EBPIG Resource Package for guidance in reviewing the design used.

Comments on Design

Pages 12 to 15 of the Resource Manual should again assist here. You may also find it useful to refer to the forms 'Evaluating case studies/case series' and 'Critical appraisal sheet' adapted from Dr Lil Mikuletic's (see 'Critiquing/Appraising the Evidence').

Level of Evidence

It is recommended that the paper you are reviewing be rated against the NH&MRC Levels of Evidence, as reproduced here. The levels may be updated from time to time by the NH&MRC, but use of the ratings listed here will ensure consistency across CATs and groups. These levels are listed with comments on pages 15 and 16 of the Resource Package.

LEVEL

- I.** Evidence obtained from a systematic review of all relevant controlled trials
- II.** Evidence obtained from at least one properly designed randomised controlled trial
- III.**
 - 1** Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)
 - 2** Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group
 - 3** Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group
- IV.** Evidence obtained from case series, either post-test or pre-test and post-test