



NSW Speech Pathology Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE: Stimulable phonemes are acquired in the phonetic inventory of children with phonological impairment more easily than non-stimulable phonemes, regardless of the treatment target selected.

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 academic specialising in paediatric speech sound disorders.

Citation: Powell, T. (1993) Phonetic inventory constraints in young children: factors effecting acquisition patterns during treatment. *Clinical Linguistics and Phonetics*, 7, 45-57.

Design: Single-subject research methodology – multiple baseline design across behaviours.

Participants: Six preschoolers with a phonological impairment (4 males 2 females) aged between 59-66 months with normal language, intellectual and perceptual skills, hearing, and oral structures and functions. Phonological skills were in the lowest 5% relative to peers.

Experimental Group: Stimulability assessed for sounds in isolation and in 9 syllables that varied in position and vocalic environment. Sound considered stimulable if participant produced it with at least 10% accuracy. Each subject was taught to produce 2 sounds in succession, the 1st of which was /r/ initial for all participants. The 2nd treatment target was randomly selected. Six of the 12 sounds targeted were considered stimulable, 6 non-stimulable. Treatment consisted of contrasting minimal pairs production (5 pairs in total). Four step treatment program with sounds taught in word initial position only. Participants were seen 3x weekly for 100 minimal pair productions (approx. 30 minutes). Treated sounds were assessed using 20 item probe at the end of each session, whilst untreated sounds were probed every 4 sessions with 10 items per sound. **Control Group:** Nil.

Results: Of the 12 sounds treated directly, 9 (75%) were presenting in the phonetic inventories at the conclusion of the study. Of the 16 untreated sounds 12(75%) were added to the phonetic inventories. Of the 14 stimulable sounds, 13 (93%) were acquired. Of the 14 non-stimulable sounds, 8 (57%) were acquired. The ability to imitate a sound appeared to be an important factor in the addition of the sound to the phonetic inventory. New sounds appeared to be gradually added to phonetic inventory across time. Over-generalization of new sounds may occur. Phonetic inventory typology was successful in predicting post treatment inventory complexity level. Untreated sounds were equally likely to be added to phonetic inventory, whilst stimulable sounds were almost always added to phonetic inventory regardless of treatment target.

Comments on Design: Design limited by small number of participants.

Level of Evidence (NH&MRC): III

Appraised By: EBP Paediatric Speech Group

Date: April 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