Developing PA Interventions for Children with Hearing Loss

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Background and Aim of Study

Children with hearing loss consistently show poorer average reading development than their peers with normal hearing, and this gap continues to widen as children age. Further, results from a large scale longitudinal study (Longitudinal Outcomes of Children with Hearing Impairment; LOCHI) have shown that 5 year olds’ (generally poor) PA performance is significantly associated with their early-reading skills.

To date, there has been limited research examining the relationship between PA and reading skills for children with hearing loss. More information is needed about whether a vocabulary teaching intervention can be effective in leading to improved PA and reading development in children with hearing loss.

The aim of this study is to compare the relative efficacy of two intervention techniques (explicit PA instruction and vocabulary instruction) for enhancing the development of PA and literacy skills in children with hearing loss.

Methodology

Recruitment
A total of 60-80 children will be recruited within Sydney, Melbourne, and Brisbane and allocated to one of two intervention groups. Recruitment focusses on children with any level of bilateral hearing loss, in the year prior to commencing school (age 4-5 years).

Interventions
- Weekly one-on-one sessions of approximately 20-30 minutes.
- Take-home worksheets provided to families to support sessions.
- Activities for each week (see note opposite) presented via a tablet computer using specifically developed apps based on the item set. Feedback is provided through the app design and by the researcher.
- Intervention activities designed to be able to be comparable across the PA and vocabulary conditions.

Pre-Assessment > Intervention (6 Weeks) > Post Assessment > 1 Year Follow-Up

Standardised Tests
- WNV, PPVT, PIPA, PAT, Digit Span
Specialised Measures
- PA & Vocabulary

Selection and Matching Tasks
- PA - Rhyme, Initial Sound, Final Sound, Blending
- Vocabulary - Extended Instruction; Semantic scaffolding

Standardised Tests
- PIPA, PAT
Specialised Measures
- PA & Vocabulary

1. Explicit PA Instruction

More information is needed about the development of PA in children with hearing loss; including whether improved PA in pre-readers facilitates subsequent reading development.

- Aim: To investigate if children with hearing loss can benefit from explicit PA instruction and vocabulary instruction.
- Interventions focus each week on a specific PA skill using items drawn from the full item set.

A Note on Item Selection
A complex set of selection criteria has led to the selection of 32 CVC items for the PA intervention. These include one set of 16 items selected to share one of 4 rhymes and 4 initial sounds (See Figure 1, shaded columns) and an additional set of 16 that utilises the same initial and final sounds but with a change in medial vowel (Fig. 1, unshaded columns). Items for the vocabulary condition are drawn from those words used in the PA condition that are likely to be unfamiliar to children. (Fig. 1, italicised)

Figure 1. A subset of word items, showing initial, rhyme and final sound categories.

2. Vocabulary Instruction

More information is needed about whether a vocabulary teaching intervention can be effective in leading to improved PA and reading development in children with hearing loss.

- Aim: To investigate if children with hearing loss can benefit from explicit PA instruction and vocabulary instruction.
- Interventions focus each week on a specific PA skill using items drawn from the full item set.

Both groups of children are assessed for:
- Developing PA skills for taught words, taught sounds, and untaught sounds.
- Knowledge of unfamiliar and familiar vocabulary items introduced in interventions.

Intervention Applications

The research team has developed apps to include matching tasks and selection tasks similar to the selected examples below. Both intervention conditions include a mix of each task style.

A Rhyme Matching Task
E.g. Does bug rhyme with hop or peak?

An Initial Sound Matching Task
E.g. Does Bone start with the same sound as Bear or Mouse?

A CVC Blending Task
E.g. What word do these sounds make? leg, bog or lug?

A Vocabulary Selection Task
E.g. Drag the pictures of people having a tap to the basic section.

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