

## Phonological and Articulation Therapy in Portuguese Children with Language Impairment

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### Abstract (75/75 words)

This study evaluates the effectiveness of two interventions (articulatory and phonological) for treatment of developmental phonological disorders in 14 pre-school Portuguese children with Language Impairment (LI) over 25 sessions. Results explored phonological ability pre- and post-intervention at single word and spontaneous speech level. The percentage consonant correct (PCC), the level of intelligibility of speech and percentage occurrence of several phonological processes were calculated for all children to compare the results of the two intervention groups.

### Summary of the proposal (997/1000 words)

#### Background

In Portugal the routine clinical practice of speech and language therapists (SLTs) in treating children with phonological impairments is articulation therapy. There is limited use of phonological therapy or phonological awareness in Portugal. Furthermore, information on the effectiveness of phonological and articulation therapy with children with LI, and the role of phonological awareness is conflicting. There is a need to assess the effectiveness of therapies that reflect the current practice of SLTs (Joffe and Pring 2003), and to compare approaches that are currently in use (phonological awareness and articulation therapy).

Gillon (2000) demonstrated that children with LI (with phonological difficulties) benefit from phonological awareness interventions. The phonological awareness intervention in Gillon's (2000) study focused primarily on developing phonological awareness skills at the phoneme level (phoneme identity, blending, segmentation, manipulation and tracking sound changes in words) and activities for letter-sound knowledge. The intervention may prove an efficient method of resolving the children's speech production errors and also may prevent reading difficulties. Children who were treated with interventions that included phonological awareness showed more improvement than children treated with other interventions that focused predominantly on resolving speech sound errors without any phonological awareness work (Gillon 2004). In contrast, Hesketh et al. (2000) did not find any benefits in speech from the addition of phonological awareness in their intervention programme.

#### Aim

To explore the effectiveness of two types of therapy in a group of 14 pre-school children (aged from 3.6 to 6.12) with LI: an articulation approach (Riper and Emerick 1984) and a phonological approach, that includes phonological awareness therapy (Gillon and McNeill 2007) and listening and discrimination activities (Lancaster 2008).

#### Method

**Subjects:** A group of 14 Portuguese children (9 boys and 5 girls) with LI was recruited through local SLTs. Prior to the start of the project, they were diagnosed as having LI with phonological impairment after extensive assessment by SLTs, audiologists and psychologists. Subject selection criteria included: greater than 1.5 standard deviation below the mean on a standardized language test (Kay and Tavares 2007); audition of 20dB or lower in the frequencies 500Hz, 1000Hz and 2000Hz; an absence of social or emotional problems and obvious neurological damage. Non-verbal IQ was assessed with the Performance Scale of the Wechsler Preschool and Primary Scale of Intelligence – Revised (Wechsler 1989). The children

were divided in two groups: one group (5 children) was identified as having a specific language impairment (non-verbal IQ above 85) (Leonard 2008); and the second group (9 children) had significant language problems coexisting with various levels of non-verbal impairment (non-verbal IQ below 85 and above 62). All children showed a discrepancy (at least 1 standard deviation) between language skills and non-verbal IQ with language being lower.

**Phonological assessment:** The children's phonological abilities were assessed in single words through a phonological test (Mendes et al. 2005) and in spontaneous speech through a picture description task (3 pictures were specifically designed for this study). The children's realisations were recorded and transcribed phonetically based on perceptual and acoustic analysis (Shriberg and Lof 1991).

**Reliability:** The first author carried out the phonetic annotations and transcriptions using the Speech Filing System (SFS) Release 4.7/Windows. In addition, the production of isolated words of 2 children, one from each group (28% of the sample), were randomly selected, and annotated and transcribed by two trained SLTs.

**Intervention:** The LI children were randomly assigned to two treatment groups (7 children in each group). A group of 7 children with LI was treated individually with an articulation approach, and their progress compared with a group of 7 children treated with a phonological approach. The intervention for both groups consisted of 25 sessions of 45 minutes in duration. Both groups were treated by the same Speech and Language Therapist (SLT) who was trained in both approaches. After 25 sessions of therapy, the children were assessed by another SLT, blind to group membership, with the same single-word phonological test used at the pre-treatment phase and with a spontaneous speech sample using the same pictures. The effectiveness of the two treatments was compared.

A questionnaire to evaluate the effectiveness of each therapy from the perspective of the children's parents was also developed. To analyse the fidelity of the treatment the first author and another SLT separately observed 6 sessions (3 articulation and 3 phonological sessions) and filled in an observational rating scale recording key elements: duration of session; target sound(s); type of reinforcement used; type of intervention; methods and activities that were the focus of the session; child's level of attention.

**Outcome measures:** To compare the results of the two groups the mean PCC score (Shriberg and Kwiatkowski 1982), the level of intelligibility of speech (percentage of intelligible words) and the percentage occurrence of phonological processes were calculated for all children. The phonological test (Mendes et al. 2005) used in this study includes the following phonological processes for analysis (Bowen 1998; Smit 2004): final consonant deletion, weak syllable deletion, cluster reduction, gliding of liquids, stopping, fronting, depalatalization, backing, palatalization and devoicing.

## Results

The range of PCC scores obtained at the beginning of the study ranged from 15.8% to 69.9% (mean=49.1%) for children in the phonological treatment group and from 23.0% to 72.7% (mean=42.5%) in the articulation treatment group. A Mann-Whitney U test was used to compare the PCC of the groups before the therapy and showed that there were no significant differences ( $p>0.05$ ) in PCC between the two groups. Preliminary results from the treatment show interesting differences between the two groups and highlight the importance of using both a single word and a spontaneous speech sample. The associations between results on the standardised measures and perceptions of the parents were also explored. Differences in the patterns of phonological performance between the children with SLI and with LI with co-existing non-verbal impairments were identified. Implications were drawn for the most comprehensive and efficient type of assessments used in clinic to assess change in phonological performance, and the most effective and efficient method of intervening for phonological disorder in children with LI.

**References (322/500 words)**

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