**INTRODUCTION**

Background

- Differential diagnosis and treatment planning of speech sound disorders (SSD) is one of the major bottlenecks in the field of pediatric speech-language pathology.
- Intervention methods aim at specific parts of the speech production process, whereas diagnostic instruments consist of tests that measure knowledge and skills, and lack a direct relation with the underlying processes.

Research goal

- An individualistic, process-oriented approach for the diagnosis and treatment of pediatric SSD.
- Advantages
  - Direct leads for treatment - tailored to the individual speaker.
  - Evaluate and adjust treatment during the evolution of the disorder.

Aim of the present study

- Development and evaluation of a learning task as an instrument to assess the acquisition of sensori-motor representations of novel speech sound units.

**METHODODOLOGY**

Participants

- 6 normally developing children: 3 male, 3 female; aged 4.87–7.8 yrs.
- 5 children with SSD: 2 male, 3 female; aged 4.3–7.5 yrs.

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<th>Table 1: Diagnostic classification of the children with speech sound disorders</th>
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<td>No.</td>
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Procedure (Table 2)

- Learning paradigm: repetition task of monosyllables from a soundboard presented via headphones.
- Stimuli: 3 non-native speech sounds (cluster) in 4 context conditions, each item repeated 3x.

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<th>Table 2: Schematic overview of the learning task</th>
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<tbody>
<tr>
<td>Stage</td>
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<tr>
<td>Introduction</td>
</tr>
<tr>
<td>Baseline measurement</td>
</tr>
<tr>
<td>Training 1</td>
</tr>
<tr>
<td>Break</td>
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<td>Training 2</td>
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<td>Endpoint measurement</td>
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**DATA ANALYSIS & RESULTS**

Data analysis

- Convergent transcription of all utterances by two experienced speech therapists.
- Dependent variables
  - Percentage consonants correct (PCC)
  - Percentage word-stress correct (PWSC: Prosody condition).

Statistics

- Repeated measures analysis of variance.
- Pearson correlations.
- Group effects
  - PCC overall: Main effect for SSD Group [F(1, 9) = 12.616, p < .05].
  - Not for gga or sja.
  - PCC per condition: Prosody [F(1, 9) = 20.909, p < .005].
  - Embedding [F(1, 9) = 4.159, p = .072].

Correlations

- PCC & auditory discrimination overall:
  - Word discrimination & overall learning effect [r = 0.601, p < .05].
- PCC & auditory discrimination per target:
  - Non-word discrimination & learning effect for gga [r = 0.649, p < .05].
  - Word discrimination & learning effect for gga [r = 0.661, p = .05].
- No significant correlations for sja or sja.

- PCC & PWSC in Prosody condition:
  - SSD Group [r = 0.671, p < .05].

Learning effects

- PCC overall:
  - Main effect for SSD Group [F(1, 9) = 5.417, p < .05].
  - Not for gga or sja.
- PCC per condition:
  - Embedding [F(1, 9) = 5.410, p < .05].
  - Sequencing [F(1, 9) = 4.939, p = .05].
- PWSC: No significant effects.
- No learning effect by group interactions.

**DISCUSSION**

- Underlying profiles vary widely per child with SSD.
- Results highlight important role of perception abilities.
  - Strong correlation between non-word discrimination score and learning effect.
- Results highlight important role of word-stress in SSD.
  - Higher PCC in the prosody condition for gga and sja in SSD vs controls.
  - Negative correlation between PCC and PWSC in the prosody condition.
  - Detailed analysis of the individual data.
  - 2 cases: trade-off between accuracy at the segmental and supra-segmental levels.

**REFERENCES**

- D. van Rooyen, “Computerized Articulation Instrument (CAI)”. Amsterdam: P. M. van der Zee, 1996.

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