

# Assessment of intelligibility in children

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This thesis is based on the following studies, referred to in the text by their Roman numerals.

- I. Johannisson [now: Lagerberg], T. B., Lohmander, A., Persson, C. Assessing intelligibility by single words, sentences and spontaneous speech: a methodological study of the speech production of 10-year-olds, *Logopedics Phoniatics and Vocology*, 2013. E-pub ahead of print.
- II. Lagerberg, T. B., Åsberg, J., Hartelius, L., Persson, C. Assessment of intelligibility using children's spontaneous speech: methodological aspects, 2013, *International Journal of Language and Communication Disorders*. In press.
- III. Lagerberg, T. B., Åsberg Johnels, J., Hartelius, L., Persson, C. Effect of number of repetitions on listener transcriptions in assessment of speech intelligibility in children, 2013. Manuscript.
- IV. Lagerberg, T. B., Åsberg Johnels, J., Hartelius, L., Ahlman, A-K., Börjesson, A., Persson, C. Swedish Test of Intelligibility for Children (STI-CH) – Validity and reliability of a computer-mediated single-word intelligibility test for children, 2013. Manuscript.

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UNIVERSITY OF GOTHENBURG

## Assessment of intelligibility in children

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### **Abstract:**

**Aim:** The overall aim of this thesis was to investigate different aspects of intelligibility in children and to develop reliable and valid methods for assessment.

**Method:** Initially, four assessment methods were studied: multiple-choice assessment and transcription of single words, transcription of sentences and transcription of spontaneous speech. Audio recordings of 74 ten-year-old children with isolated cleft palate and/or 22q11DS and 11 children with typical development were included. Validity was examined through comparison of results for the children with and without deviant speech and between 'good' and 'poor' readers. Thereafter, spontaneous speech and single words taken from the STI-CH test and repeated after a model, produced by ten children with speech-sound disorder (mean age: 6.0 years) and ten children with typical speech and language development (mean age: 5.9 years), were recorded and presented to twenty listeners. Validity was studied through an investigation of the difference in intelligibility scores between the two groups and the correlation between intelligibility scores and PCC (Percentage of Consonants Correct) scores. Inter- and intra-listener reliability was investigated in relation to all assessments included in the thesis. Finally, three conditions for listener transcription of spontaneous speech were examined: listening to each utterance once, twice and three times.

**Results:** Inter- and intra-listener reliability was satisfactory for all methods included in the thesis. A statistically significant difference between outcomes for the four assessment methods studied initially was found and validity was low for all three reading-based methods. The intelligibility scores obtained for spontaneous speech correlated with PCC scores and differed statistically significantly between the two groups, indicating high validity. Statistically significant differences in terms of intelligibility scores were found between the three conditions investigated: the intelligibility score increased with the number of repetitions. Scores on STI-CH correlated with PCC scores and with intelligibility scores obtained using spontaneous speech, and they differed statistically significantly between the two groups, thus further confirming the validity of the test.

**Conclusion:** The choice of speech material and listener task has a significant impact on results when assessing intelligibility. Reading is not a suitable elicitation technique for ten-year-olds. The assessment procedure for spontaneous speech developed as part of the thesis can be recommended for intelligibility assessment, especially if the mean across several listeners is used, but the number of times a speech material is repeated to listeners must be reported. Finally, the single-words test developed as part of the thesis (STI-CH) showed good validity and reliability for the participants included.

**Keywords:** intelligibility, speech sound disorder, children, speech disorder, assessment

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