

# TOWARDS A VOCAL ENDURANCE TEST WITH PROGNOSTIC VALUE: CHANGES IN VOICE QUALITY AND LARYNGEAL COMFORT AFTER VOCAL LOADING IN FUTURE TEACHERS.

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Teachers show a high rate of voice problems. The development of a test that is able to predict whether the vocal endurance is sufficient to cope with the daily phonatory effort of a teacher, has been a longstanding goal that has, up to now, not been reached. This study shows a first step in the development of such an assessment.

Thirty students nursery, primary and secondary education of the Artevelde University College were willing to participate after being informed on the aim of the study. Prior to the vocal loading, all participants filled out some questionnaires and a first acoustic voice assessment was done. The questionnaires used were a Dutch translation of the Vocal Fatigue Index 'stemvermoeidheidsindex or SVI' (Mertens, 2015), the Current Speaking Effort Level or EFFT (Hunter and Titze, 2009), the Voice Stress Inventory or VSI (De Bodt et al., 2008), the Vocal Tract Discomfort or VTD (Luyten et al., 2015). The vocal loading task was based on a previous study of Niebudek-Bogusz et al. (2007) and consisted of reading out loud a text during 30 minutes in the presence of babble noise of 80 dB SPL. Immediately after the vocal loading, all questionnaires except the SVI were filled out again and the same acoustic measurements were done. This was done a third time after 45 minutes of absolute voice rest.

The acoustic voice assessment was based on former research of Buekers et al. (1996, 1998), Boucher (2008), Niebudek-Bogusz et al. (2007), Laukkanen et al. (2008), Guzman et al. (2013) and Maryn (2015). Using Voice Range Profile (VRP) of the Computerized Speech Lab (Kay Elemetrics), the intensity or I (dB SPL) and the fundamental frequency or F<sub>0</sub> (Hz) of soft, normal and loud speech was determined. A sustained vowel /aa/ was recorded as well as two Dutch sentences. Both samples, the sustained vowel (sv) and the current speech (cs), were produced softly, normally and loudly. F<sub>0</sub> (Hz), Jitter %, shimmer %, Noise-to-Harmonics-Ratio, Soft Phonation Index and tremor parameters were analysed using the Multidimensional Voice Program (MDVP), the Cepstral Peak Prominence (CPP) using the Analysis of Dysphonia in Speech and Voice (ADSV), and the Acoustic Voice Quality Index (AVQI) using Praat.

Statistics will be done to reveal whether the results on the questionnaires, the intensity and pitch of soft, normal and loud automatic speech, the ratio between I and F<sub>0</sub> and the acoustic measures of sv and cs show significant changes from one test moment to another. Correlation between different measures is also object of study. A longitudinal follow-up of as much participants as possible the coming years, will provide us with information regarding the prognostic value of the tests used in this study.

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