Every Word Counts - A Reliability Analysis Between Adult Word Count in LENA Pro and Manual Counts on Swedish Adults

Jonas Fogels[1], Radoslava Jönsson[1], André Sadeghi[2], Ulrika Löfkvist[3]
1 Department of Otorhinolaryngology, Institute of Clinical Sciences, Sahlgrenska Academy, Gothenburg University
2 Department of Audioogy, Institute of Neuroscience and Physiology, Sahlgrenska Academy, Gothenburg University
3 Department of Public Health and Caring Sciences, Medicine and Pharmacy, Faculty of Medicine, Uppsala

Department of Otorhinolaryngology
Institute of Clinical sciences

UNIVERSITY OF GOTHENBURG

Background

Language Environment Analysis (LENA®) is a system that includes a digital sound recorder and an analysis program designed to segment audio recordings into different communication variables. It was originally developed to monitor the language environment of children and their parents in everyday settings.

Aims

This project aims to explore whether LENA® also could be used for adults with hearing loss. The purpose of this investigation is twofold: first, to determine if LENA® Pro can measure differences in sound environments and social contexts based on the type of hearing aid used, and second, to evaluate its potential use in hearing rehabilitation and future research studies.

The initial step in this process is to assess if LENA® Pro is accurate and valid for use in Swedish on adults. This is the first validation study of LENA® Pro where the target population is adults.

With Permission from LENA®

Method

Participants: Seventeen adults, twelve females and eight men with a mean age of 59,8 years (range: 31 to 72). Nine with non-disabling hearing loss and eight with severe to profound hearing loss, two subgroups of hearing status in order to explore any potential differences.

The participants were instructed to wear the recorder for 12 hours on two separate occasions within the same week: one weekday (Monday to Friday) and one weekend day. Four 5-minute segments with the highest Adult Word Count (AWC) were selected from each participant's recordings. Ten minutes from the weekday and 10 minutes from the weekend, a total of 20 minutes per participant.

One rater transcribed all selected recordings, while a second rater transcribed a smaller subset to assess interrater reliability. The number of words from the manual transcriptions were then compared with the AWC generated by LENA® Pro. The Pearson correlation coefficient was calculated to determine the relationship between the manual word counts and the Adult Word Counts provided by LENA® Pro.

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Preliminary results

From the 17 participants 64 recordings of 5-minute segments were manually transcribed. In total 320 transcribed minutes from 816 recorded hours (48600 minutes) were retrieved. The mean per 5-minute segment for LENA® AWC was 948 words and for the manual count the mean was 920 words. Pearson correlation was similar to what have been reported in previous studies on other European languages for children and in line with our intraclass correlation analysis. More detailed results will be presented in a scientific article.

Conclusion

This validation indicates that LENA® can be used in a Swedish context when the talker is an adult, but with extra concern that variability will occur.

Take home message

LENA® could be a useful tool in hearing rehabilitation on adults in the future, providing data on real-life communication environments and the effectiveness of different types of hearing technology.

For additional information, please contact:
Name: Jonas Fogels
E-mail: jonas.fogels@vgregion.se