Is children’s listening effort in background noise influenced by the speaker’s voice quality?

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Authors: Birgitta Sahlén (1), Magnus Haake (2), Heike von Lochow (1), Holm, L (1), Tobias Kastberg (1), Jonas Brännström (1), & Viveka Lyberg-Åhlander (1)

(1) Department of Logopedics, Phoniatrics and Audiology, Clinical Sciences in Lund, Lund University, Lund, Sweden.
(2) Division of Cognitive Science, Lund University, Lund, Sweden.

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Abstract

The present study aims at exploring the influence of voice quality on listening effort in children performing a language comprehension test with sentences of increasing difficulty. Listening effort is explored in relation to gender (cisgender). The study has a between-groups design. Ninety-three mainstreamed children aged 8;2 to 9;3 with typical language development participated. The children were randomly assigned to two groups (n = 46/47) with equal allocation of boys and girls and for the analysis to four groups depending of gender and voice condition. Working memory capacity and executive functions were tested in quiet. A digital version of a language comprehension test (the TROG-2) was used to measure the effect of voice quality on listening effort, measured as response time in a forced-choice paradigm. The groups listened to sentences through recordings of the same female voice, one group with a typical voice and one with a dysphonic voice, both in competing multi-talker babble noise. Response times were logged after a time buffer between the sentence-ending and indication of response. There was a significant increase in response times with increased task difficulty and response times between the two voice conditions differed significantly. The girls in the dysphonic condition were slower with increasing task difficulty. A dysphonic voice clearly adds to the noise burden and listening effort is greater in girls than in boys when the teacher speaks with dysphonic voice in a noisy background. These findings might mirror gender differences as for coping strategies in challenging contexts and have important implications for education.

Keywords
Babble noise; children, classroom; cognitive capacity; dysphonic teacher voice; gender; noise; response times; task difficulty.