Are children with stronger cognitive capacity more or less disturbed by classroom noise and dysphonic teachers?


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Abstract

Purpose: This study aimed to explore if dysphonic voice quality affects children's performance on a language comprehension test, the Test for Reception of Grammar-2 (TROG-2), performed in simultaneous background noise (non-semantic babble). A further aim was to investigate the role of Working Memory Capacity (WMC) and Executive Functioning (EF) in coping with the voice against a background of babble conditions.

Method: Ninety-three mainstreamed 8 year old children with typical language development were tested for WMC and EF. Two groups of children (n = 47/46) were formed and presented with recordings of TROG-2 instructions read by one female speaker: one group was presented with recordings with induced dysphonic voice quality, the other with recordings of typical voice. Both groups listened to the voice recordings in competing babble noise at a Signal-to-Noise Ratio of +10 dB.

Result: Significant differences were found for the interaction between cognitive capacity and the TROG-2 results in relation to the voice conditions. In the dysphonic voice condition, children with better WMC results scored higher at the easier comprehension tasks. In the typical voice condition, children with better WMC and EF results scored higher on the more difficult tasks. Seventeen per cent of the variance for the TROG-2 results was explained by the WMC and EF results. There was no overall effect on the children's performance depending of voice condition.

Conclusion: The effect of the speaker's voice quality on children's performance varies depending on the prevalence of background babble noise and on the task demands. The dysphonic voice and babble noise seem to demand allocation of cognitive capacities at the cost of language comprehension.

Keywords
Language comprehension, working memory capacity, voice

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