A speech pronunciation practice system for speech-impaired children: A study to measure its success

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Background: The speech pronunciation practice (SPP) system enables children with speech impairments to practice and improve their speech pronunciation. However, little is known about the surrogate measures of the SPP system.

Aims: This research aims to measure the success and effectiveness of the SPP system using three surrogate measures: usage (frequency of use), performance (recognition accuracy) and satisfaction (children's subjective reactions), and how these measures are aligned with the success of the SPP system, as well as to each other.

Methods and procedures: We have measured the absolute change in the word error rate (WER) between the pre- and post-training, using the ANOVA test. Correlation co-efficiency (CC) analysis was conducted to test the relation between the surrogate measures, while a Structural Equation Model (SEM) was used to investigate the causal relations between the measures.

Outcomes and results: The CC test results indicate a positive correlation between the surrogate measures. The SEM supports all the proposed hypotheses. The ANOVA results indicate that SPP is effective in reducing the WER of impaired speech.

Conclusions and implications: The SPP system is an effective assistive tool, especially for high levels of severity. We found that performance is a mediator of the relation between “usage” and “satisfaction”.

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