

The UltraPhonix Project: Ultrasound Visual Biofeedback for Heterogeneous Persistent Speech Sound Disorders

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Ultrasound Tongue Imaging (UTI) is gaining popularity as a visual biofeedback tool that is cost-effective and non-invasive. The evidence for Ultrasound visual biofeedback (U-VBF) therapy is small but promising, with around 20 case or small group studies. However, most studies originate from the USA and Canada, and focus on the remediation of delayed/disordered /r/ production (for example McAllister et al., 2014). While ultrasound is ideal for visualising /r/ productions, it also offers the ability to visualise a much larger range of consonants and all vowels, for example Cleland et al. (2015) report success in treating persistent velar fronting and post-alveolar fronting of /j/. This paper will report on a new project, "UltraPhonix" designed to test the effectiveness of U-VBF for a wider range of speech sounds in more children than previously reported.

The UltraPhonix project will recruit 20 children aged 6 to 15 with persistent speech sound disorders affecting vowels and/or lingual consonants in the absence of structural abnormalities. Since the children will have a range of different speech targets, the project design is a single-subject, multiple baseline design, with different wordlists (probes) designed according to the presenting speech error. Children will receive 10 sessions of U-VBF therapy, preceded by three baseline probes, and followed by two maintenance measures. This project uses a high-speed Ultrasonix SonixRP machine running Articulate Assistant Advanced software (Articulate Instruments, 2012) at 121 frames per second allowing us to capture dynamic information about the children's speech errors for diagnostic purposes. Moreover, the ultrasound probe is stabilised with a headset, allowing us the unique capability to compare ultrasound data across assessment and therapy sessions (see Cleland et al., 2015). Bespoke U-VBF therapy software has already been designed allowing us to super-impose hard palate traces on the ultrasound image and view target videos of typical speakers articulating the target speech sounds.

Our poster presents the methodology of our new project and give sample data from the first group of participants recruited to the project.

References

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