Speech Characteristic of French-Speaking Children with Dysarthria: Pilot Study





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- Cerebral Palsy (CP) is a common cause of disability among children but few studies exist on the speech abilities of these children, particularly in languages other than English (Miller & Lowit,
- Although French is among thetop 20 most spoken languages worldwide, there are few published studies describe speech sound or prosodic characteristics of children with dysarthria who are acquiring French.
- There are also few studies that examine speech intervention for children with this disorder (Pennington, Miller, & Robson, 2009)
- Speech-language pathologists (SLPs) have a weak research-base to guide their assessment and intervention strategies for improving the children's communication

Speech Characteristics of Children with Dysarthria Due to CP

- Vocal intensity and articulatory working space are reduced in many children with dysarthria due to cerebral palsy (CP).
- · Small treatment studies have suggested that targeting vocal intensity improves aspects of vocal functioning in this population (Fox & Boliek, 2012; Levy, Ramig, & Camarata, 2012), although less is known about the consequences for intelligibility.
- · Cueing and modeling hyperarticulated speech can elicit hyperarticulation in typically-developing children (Eaton & Ratner, 2013), but it is not clear that this is also true for children with dysarthria, whose motor restrictions may limit their abilities to imitate speech-styles.

Speech Characteristics Study

- For typically-developing children, research has shown that that cross-linguistic differences can impact the accuracy of speech production.
 - · For example, French-speaking children master the speech sound /s/ at an earlier age than their English-speaking peers (MacLeod et al., 2011).
- . In addition, prosodic differences, such as intonation and stress, between French and English may impact children's intelligibility.
- . Thus, it is important to include cross-linguistic descriptions of dysarthria among children with CP to ensure that key clinical markers are generally observed, and not specific to English speakers
- This may shed light on universal speech, characteristics of dysarthria, as well as language-specific.

Treatment Study

- Reduced speech intelligibility is a primary disability in children with cerebral palsy (CP) with dysarthria (Kennes et al., 2002).
- Extension of treatment study previously conducted with American-English speaking children (Lew, 2014; Lew, Ramig, & Camarata, 2012) to French speaking children
- Treatment based on Speech Systems Intelligibility Treatment (SSIT) (Levy, 2014), consisting of instruction on articulatory posture and phonation.
- . Levy, Chang, Ancelle and McAuliffe (2016) foundgreater durations when American-English speaking children with dysarthria were prompted to speak with a "Big mouth," and higher intensity when they were prompted to speak with "Strong voice." Sentence and word intelligibility increased as a function of both prompts.

Overview of Study

Research Questions

- (1) What are the language-specific and universal speech characteristics of children with dysarthria due to CP?
- (2) What are the effects of prompting children to use a "big mouth" and "strong voice" in improving the intelligibility of children with dysarthria who speak French?
- (3) What is the treatment outcome and maintenance of SSIT among English, French

Participants

12 native Belgian French-speaking children with CP Age range: 5;6-17;0 years (mean=10;2) w. spastic dysarthria (mild to moderate-severe) Measures (Pre-/Post-Intervention)

 Oral mechanism exam Sneech sound accuracy at word and sentence levels **Phonological Tasks** Error patterns at word and sentence levels Minimal pairs task to explore specific phonemes Experimental Tasks Words embedded in sentence to explore specific phonemes

Treatment Study Design

Non-Speech Tasks

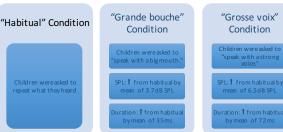
Pre-Intervention

Intervention

Post-Intervention 6 months after last session

Preliminary Analyses and Results

- · From the experimental tasks: Children repeated recorded utterances produced by an adult native French speaker. The 17 words were contrastive (based on Ansel & Kent, 1992) and uttered in the carrier phrase "Elle dit CVC(C) peut-être".
- A Shure head set-microphone was 8 cm from lips. Calibration was completed with tone played 8 cm from microphone. Experimenter noted sound-pressure level (SPL) on Galaxy SP-meter adjacent to
- Changes in Sound Pressure Level (SPL) and duration were measure acoustically across three conditions



Children were stimulable to the the prompts of "grande houche" and "grosse voix". Greater change was observed in both SPL and duration for "grosse voix"

Future Directions

- Within-subject and between group comparisons of acoustic analysis (e.g., vowel contrasts); perceptual analyses: and articulation assessments.
- · Examine children's results on pre and post phonological tasks to identify particular phonemes that are in error to suggest potential clinical implications.
- · In addition, similarities to and differences from research on English-speaking children will be examined.
- . Continue the treatment "camp" in Summer 2016.

Clearly, in languages such as French, efficacy of intervention could be assessed only with further understanding of this population's speech characteristics.

References

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Many thanks to the children and their families for participating in this

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