

## A crosslinguistic study of phonological development: Utilization of Phon now and in the future

A crosslinguistic study is addressing phonological development in children with typical (TD) and protracted phonological development (PPD) in Bulgarian, Croatian, English, French, German, Hungarian, Icelandic, Japanese, Kuwaiti Arabic, Mandarin, Portuguese, Slovenian, Spanish, and Swedish. The study has two major objectives: (1) to determine universal and language-specific patterns in phonological development; and (2) to develop and disseminate phonological assessment tools, i.e. picture-based elicitations, analysis procedures, criterion reference data and intervention activities. Phon provides support for development of those reference data. The current presentation for the panel "Software-assisted analysis for clinical linguistics" will: (1) outline the study briefly; (2) provide sample criterion reference data; and (3) outline possible revisions of Phon for clinical assessment. The crosslinguistic study evaluates children's skills at all levels of the phonological hierarchy: word, foot, syllable, timing units (Cs, Vs), segments and features. Audio-recorded data (approximately 100 words per child, representative of the language's phonology) are transcribed and analyzed within Phon. Accuracy and mismatch reference data are compiled. Global measures evaluate whole word production, foot/stress, word shapes (CV), and segments (percent consonants or vowels "correct"). Criterion reference data show e.g.: (1) 75-85% whole word accuracy for typical 4-year-olds across languages; and (2) a 15-30% gap in word shape match for Spanish- and German-speaking TD and PPD preschoolers (e.g. Chávez-Peón et al., 2013: 64% vs 48%, age 3; 90% vs 60%, age 4). Specific measures evaluate individual word structures and sound classes, e.g. fricatives in German, English and Icelandic (Bernhardt et al. 2014; Bernhardt et al. 2015). Across the three languages, word-initial fricatives showed a 38% match for preschoolers with PPD, /f/ was the most accurate fricative, and grooved sibilants, the least accurate. The language's phonetic inventory affected substitutions observed, e.g. more palatal fricative substitutions in German and Icelandic than in English. Ongoing analyses will provide more such criterion reference data to be made available on the crosslinguistic project website, <http://phonodevelopment.sites.olt.ubc.ca> (where phonological assessment materials are also available) and PhonBank (where transcriptions and audio-recordings will be provided as permissions allow). Ongoing studies include case profiles of children with PPD and comparison of word-initial rhotic clusters in languages with tap and trill. The current presentation will culminate with a discussion of possible future innovations for Phon, e.g., analyses that would allow evaluation of interactive constraints between levels of the linguistic system (e.g. between word length, stress, segments and features; between phonology and morphology). These would be particularly helpful for analysis of multisyllabic words, a key consideration in phonological assessment of older children (Mason 2015). Built-in elicitation tools could further enhance Phon's clinical utility, with those from the crosslinguistic project as a starting point. Inclusion of reference data at various levels of the phonological hierarchy could assist clinicians in identifying PPD in a variety of languages and provide a starting point for goal selection and strategy development for phonological intervention. Through rapprochement of research and clinical applications, both will gain, the former in terms of new data for analysis and the latter in terms of more advanced analysis potential.

### References:

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