

guals, with consequences for speech production. The phonemes /v/ and /w/ are from the same category in Norwegian, rendering them perceptually indistinguishable to the native Norwegian listener. In English, /v/ and /w/ occupy two categories. Psychoacoustic testing on this phonemic distinction in the current study will compare perceptual abilities of monolingual English and bilingual Norwegian/English listeners. Preliminary data indicates that Norwegian/English bilinguals demonstrate varying perceptual abilities for this phonemic distinction. A series of speech sounds have been generated by an articulatory synthesizer, the Tube Resonance Model, along a continuum between the postures of /v/ and /w/. They will be presented binaurally over headphones in an anechoic chamber at a sound pressure level of 75 dB. Differences in the perception of the categorical boundary between /v/ and /w/ among English monolinguals and Norwegian/English bilinguals will be further delineated.

#### **2aSC10. Perception of coarticulated tones by non-native listeners.**

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Mandarin lexical tones vary in their acoustic realization depending on the surrounding context. Native listeners compensate for this tonal coarticulation when identifying tones in context. This study investigated how native English listeners handle tonal coarticulation by testing native English and Mandarin listeners discrimination of the four Mandarin lexical tones in tri-syllabic sequences in which the middle tone varied while the first and last tones were held constant. Three different such frames were tested. As expected, Mandarin listeners discriminated all pairs in all contexts with a high degree of accuracy. English listeners exhibited poorer discrimination than Mandarin listeners and their discrimination accuracy showed a high degree of context dependency. In addition to assessing accuracy, reaction times to correctly discriminated different trials were entered into a multidimensional scaling analysis. For both listener groups, the arrangement of tones in perceptual space varied depending on the surrounding context suggesting that listeners attend to different acoustic attributes of the target tone depending on the surrounding tones. These results demonstrate the importance for models of cross-language speech perception of including contextual variation when characterizing the perception of non-native prosodic categories. [Work supported by NIH/NIDCD]

#### **2aSC11. Plasticity in speech production and perception: A study of accent change in young adults.**

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This study investigated plasticity in speech production and perception among university students, as individuals change their accent from regional to educated norms. Subjects were tested before beginning university, 3 months later and on completion of their first year of study. At each stage they were recorded reading a set of test words and a short passage. They also completed two perceptual tasks; they found best exemplar locations for vowels embedded in carrier sentences and identified words in noise. The results demonstrated that subjects changed their spoken accent after attending university. The changes were linked to sociolinguistic factors; subjects who were highly motivated to fit in with their university community changed their accent more. There was some evidence for a link between production and perception; between-subject differences in production and perception were correlated. However, this relationship was weaker for within-subject changes in accent over time. The results suggest that there were limitations in the ability of these subjects to acquire new phonological rules.

#### **2aSC12. Articulatory settings of French-English bilingual speakers.**

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The idea of a language-specific articulatory setting (AS), an underlying posture of the articulators during speech, has existed for centuries [Laver, *Historiogr. Ling.* 5 (1978)], but until recently it had eluded direct measurement. In an analysis of x-ray movies of French and English monolingual speakers, Gick *et al.* [Phonetica (in press)] link AS to inter-speech posture, allowing measurement of AS without interference from segmental targets during speech, and they give quantitative evidence showing AS to be language-specific. In the present study, ultrasound and Optotrak are used to investigate whether bilingual English-French speakers have two ASs, and whether this varies depending on the mode (monolingual or bilingual) these speakers are in. Specifically, for inter-speech posture of the lips, lip aperture and protrusion are measured using Optotrak. For inter-speech posture of the tongue, tongue root retraction, tongue body and tongue tip height are measured using optically-corrected ultrasound. Segmental context is balanced across the two languages ensuring that the sets of sounds before and after an inter-speech posture are consistent across languages. By testing bilingual speakers, vocal tract morphology across languages is controlled for. Results have implications for L2 acquisition, specifically the teaching and acquisition of pronunciation.

#### **2aSC13. Paired variability indices in assessing speech rhythm in Spanish/English bilingual language acquisition.**

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Traditionally, English is classified as a stress-timed language while Spanish is classified as syllable-timed. Examining the contrasting development of rhythmic patterns in bilingual first language acquisition should provide information on how this differentiation takes place. As part of a longitudinal study, speech samples were taken of a Spanish/English bilingual child of Argentinean parents living in the Midwestern United States between the ages of 1;8 and 3;2. Spanish is spoken at home and English input comes primarily from an English day care the child attends 5 days a week. The parents act as interlocutors for Spanish recordings with a native speaker interacting with the child for the English recordings. Following the work of Grabe, Post and Watson (1999) and Grabe and Low (2002) a normalized Pairwise Variability Index (PVI) is used which compares, in utterances of minimally four syllables, the durations of vocalic intervals in successive syllables. Comparisons are then made between the rhythmic patterns of the child's productions within each language over time and between languages at comparable MLUs. Comparisons are also made with the rhythmic patterns of the adult productions of each language. Results will be analyzed for signs of native speaker-like rhythmic production in the child.

#### **2aSC14. Recognition of function words in 8-month-old French-learning infants.**

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Previous work has shown that German-learning 7-9-month-old infants recognize function words (Hoehle and Weissenborn, 2003). English-learning infants recognize function words around 10.5-11 months (Schafer *et al.* 1998; Shady, 1996; Shi *et al.*, 2003, 2004), and the highly frequent determiner "the" at 8 months (Shi *et al.*, 2004). The present study investigates French-learning infants' recognition of function words. As French is a syllable-timing language, the fuller syllabic status may allow infants to recognize function words earlier than English-learning infants. Syntactically and morphologically, functional elements occur more systematically in French than in English, providing reliable statistical cues to functor segmentation. Using a preferential looking procedure, we familiarized 8-month-olds with a target function word ("des," "la," "mes" or "ta"), and tested them with phrases containing the target versus a non-target.