4pSA2. Acoustic characterization of magnetorheological fluids. Frank Fratantonio, Thomas R. Howarth, Jeffrey E. Boisvert, Anthony Bruno (Naval Sea Systems Command Div. Newport, Newport, RI 02841), Clyde L. Scandrett (Naval Postgrad. School, Monterey, CA 93943), and William M. Wynn (Naval Sea Systems Command Div. Panama City, Panama City Beach, FL 32407)

Magnetorheological (MR) fluids contain magnetic particles dispersed within a host fluid. These materials are considered a type of "smart" fluid in that their viscoelastic properties can be controlled by varying the magnetic field intensity. MR fluids have found favor in high-end automobile applications such as the General Motors dynamic MR suspension system which has been in Corvettes (and other GM products) since 2005. Recently there has been interest in understanding the acoustic properties of MR fluids. In particular, the ability to control the radial and orthogonal bulk moduli suggests that MR fluids are a potential candidate for acoustic metamaterial applications. This presentation will discuss MR fluids and a method for the acoustic characterization of these fluids as functions of frequency and magnetic drive levels. [Work supported by the Office of Naval Research.]

3:00—3:30 Panel Discussion

THURSDAY AFTERNOON, 18 NOVEMBER 2010   GRAND CORAL 3, 1:00 TO 5:00 P.M.

Session 4pSC

Speech Communication: Production and Perception of Spontaneous Speech II (Poster Session)

Ann R. Bradlow, Cochair
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Valerie L. Hazan, Cochair
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Contributed Papers

All posters will be on display from 1:00 p.m. to 5:00 p.m. To allow contributors an opportunity to see other posters, contributors of odd-numbered papers will be at their posters from 1:00 p.m. to 3:00 p.m. and contributors of even-numbered papers will be at their posters from 3:00 p.m. to 5:00 p.m.

4pSC1. Using hyperarticulation to quantify interaction between discourse functions. Valerie Freeman (Dept. of Linguist., Univ. of Washington, C-104 Padelford Hall, Box 354360, Seattle, WA 98195, valerief@uw.edu)

Social factors are known to affect speech production, but in discourse and conversation analytic branches of sociolinguistics, quantitative measures are not as common as qualitative observations. This study uses acoustic measures of hyperarticulation to quantify the effects of two interacting discourse functions: new-information signaling and stance expression. For each of five speakers in an hour-long political talk show, content analysis was performed on all phrases repeated three or more times to separate neutral from stance-expressing tokens and new from given repetitions of those tokens. Word, syllable, and vowel duration were measured from spectrograms; formant (LPC) and pitch (autocorrelation) values were measured at onset, 20%, 50%, 80%, and offset of stressed vowels. Preliminary results from repeated measures analysis of variance suggest that stance is indeed a significant predictor of hyperarticulation which interacts with newness for at least some speakers. This work shows one way that acoustic measures can quantify the relative contributions of interacting discourse variables and their effects on speech variation. The findings also have implications for future work in speech recognition: physical measures of hyperarticulation could be combined with parsing for newness to identify stance expression in natural speech or produce it in synthesized speech.

4pSC2. Use of linguistic knowledge in the recognition of reduced words: Effects of age and high-frequency hearing loss. Esther Janse (Max Planck Inst. of Psycholinguistics, P.O. Box 310, 6500 AH Nijmegen, The Netherlands, Esther.Janse@mpi.nl) and Mirjam Ernestus (Radboud Univ. Nijmegen, Nijmegen, The Netherlands)

Older adults have more language experience than young adults and may therefore rely more strongly on transitional probabilities between words for spoken word recognition. We investigated recognition of acoustically reduced words (such as "promised") that were followed by a word with which it either formed a fixed expression ("promised land") or not ("promised lamp"). Our research questions were (a) whether older adults show a greater following-word context effect on target word recognition than young adults; (b) whether low-pass filtering the stimuli would bring about a stronger reliance on following context in young adults; and (c) whether there are any interactions with the morphological complexity of the target word (e.g., "promised" versus "fat"), because complex and longer words can be more reduced. Data analysis (recognition accuracy and RTs) showed that words were better recognized when part of a fixed expression, and that older adults benefited more in RT than young adults (equal benefit in accuracy), but only for the morphologically complex target words. The young adults with simulated hearing loss, however, benefited less than the other two groups (both in accuracy and RT). These results suggest that signal degradation does not immediately lead to greater reliance on following-word context.

4pSC3. Modulation of phonetic duration by morphological and lexical predictors. Michelle Sims, Benjamin V. Tucker, and Harald Baayen (Dept. of Linguist., Univ. of Alberta, 4-32 Assiniboia Hall, Edmonton, AB T5K 1T2, Canada, mnsims@ualberta.ca)

This study investigates how the duration of the stem vowel of regular and irregular English verbs is modulated by tense (present and past), regularity, lexical frequency, gang size of the vocalic alternation, imageability ratings, and vowel quality. The vocalic durations of 48 monosyllabic irregular verbs and 171 regular verbs were extracted from the Buckeye Corpus of spontaneous speech. A linear mixed effects regression model revealed that vowels of past tense forms tend to have longer durations than vowels of present tense forms, that vowels of words that are less imageable are realized with shorter durations, and that tense vowels are longer than lax vowels. Surprisingly, higher frequency irregular past tense forms were pro-

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