5aSC5. Laryngeal dynamics and vocal fold tissue engineering in a rabbit model. Michael Döllinger (Dept. of Otorhinolaryngology, Head and Neck Surgery, Div. of Phoniatrics and Pediatric Audiol., Univ. Hospital Erlangen, Bohlenplatz, 21, Erlangen, Bavaraia 91054, Germany, michael.doellinger@uk-erlangen.de), Veronika Birk, Stefan Kniesburges (Dept. of Otorhinolaryngology, Head and Neck Surgery, Div. of Phoniatrics and Pediatric Audiol., Univ. Hospital Erlangen, Erlangen, Bavaria, Germany), Christoph Alexiou (Dept. of Otorhinolaryngology, Head and Neck Surgery, Section of Experimental Oncology and Nanomedicine, Univ. Hospital Erlangen, Erlangen, Bavaria, Germany), Olaf Wendler (Dept. of Otorhinolaryngology, Head and Neck Surgery, Experimental ENT Res. Lab. I, Univ. Hospital Erlangen, Erlangen, Germany), Marina Pöttler (Dept. of Otorhinolaryngology, Head and Neck Surgery, Section of Experimental Oncology and Nanomedicine, Univ. Hospital Erlangen, Erlangen, Germany), Anne Schützenberger, and Stefan Dürr (Dept. of Otorhinolaryngology, Head and Neck Surgery, Div. of Phoniatrics and Pediatric Audiol., Univ. Hospital Erlangen, Erlangen, Germany)

Vocal fold surgery, especially due to cancer treatment, yields reduced voice quality and consequently reduced quality of life for patients. Hence, the development of vocal fold implants, to restore missing vocal fold tissue after surgery, is an urgent clinical need. To achieve this, a rabbit model is applied as a first step. Ex-vivo dynamic experiments were performed on twelve rabbit larynges providing normative phonatory data. The larynges were phonated at sustained phonation for different elongation levels at varying subglottal pressures. Laryngeal vibrations, airflow, and acoustics were recorded. Subsequently, for each larynx, a defined area of one vocal fold was resected, simulating the surgical intervention, and were phonated again with the same stimulations. The untreated larynges showed expected behavior regarding flow-pressure relation, acoustics and dynamics. In contrast, the phonatory quality of the resected larynges was significantly reduced showing, as expected, highly disturbed dynamics and acoustics. Parallel, vocal fold fibroblasts were isolated from rabbit larynges and cultured. These cells were treated with superparamagnetic iron oxide nanoparticles enabling their magnetic control. By magnetic tissue engineering three dimensional structures were designed. Next, the applicability of this tissue engineered implant will be tested in the dynamic ex-vivo rabbit model to compare the phonatory outcome.

5aSC6. A study of reliability parameters extracted through voice analysis. Hyung Woo Park (IT, SoongSil Univ., 1212 Hyungham Eng. Bldg. 369 Snagdo-Ro, Dongjak-Gu, Seoul, Seoul 06978, South Korea, pphw@ssu.ac.kr) and Sangmin Lee (Business Administration, SoongSil Univ., Seoul, South Korea)

The human voice is one of the easiest methods for the information transmission between human beings. The characteristics of the voice can be varied by different people and different situations, such as utterance speed, pitch tone, vocal organ features, and the gender. Moreover, the voice can be used as a factor for deciding the personal credit rating scores. The reliable parameters of speech signal can be extracted from different characteristics of the spoken information. In this paper, we collected the voices from people who has relatively high personal credit scores, and analyzed them.

5aSC7. Acoustic similarities among female voices. Patricia Keating and Jody Kreiman (Dept. of Linguist, UCLA, Los Angeles, CA 90095-1543, keating@humnet.ucla.edu)

Little is known about how to characterize normal variability in voice quality within and across utterances from normal speakers. Given a standard set of acoustic measures of voice, how similar are samples of 50 women's voices? Fifty women, all native speakers of English, read 5 sentences twice on 3 days—30 sentences per speaker. The VoiceSauce analysis program estimated many acoustic parameters for the vowels and approximant consonants in each sentence, including F0, harmonic amplitude differences, harmonic-to-noise ratios, formant frequencies. Each sentence was then characterized by the mean and standard deviation of each measure. Linear discriminant analysis tested how well each speaker's set of 30 sentences could be acoustically distinguished from all other speakers' sentences. Initial work testing just 3 speakers from this sample found that the speakers could be completely discriminated (classified) by these measures, and largely discriminated by just 2 of them. Such a simple result is not expected for the larger sample of speakers. We will present results concerning how successfully speakers can be discriminated, how well different numbers of discriminant functions do, and which acoustic measures do the most work. Implications for recognition by listening will be discussed. [Work supported by NSF and NIH.]

5aSC8. A study on prediction of end-of-utterance by prosodic features and phrase-dependency structure in spontaneous speech. Yuichi Ishimoto (Ctr. for Res. Resources, National Inst. for Japanese Lang. and Linguist, 10-2 Midoricho, Tachikawa, Tokyo 190-8561, Japan, yishi@ninjal.ac.jp), Takehiro Teraoka, and Mika Enomoto (School of Media Sci., Tokyo Univ. of Technol., Hachioji, Tokyo, Japan)

This study is aimed at predicting the end of utterance by prosodic features and syntactic structure for spontaneous speech. In spontaneous everyday conversation, participants must predict the ends of utterances of a speaker to perform smooth turn-taking. We consider that they utilize not only syntactic factors but also prosodic factors for the end-of-utterance prediction because of the difficulty of prediction of a syntactic completion point in spontaneous Japanese speech. In previous studies, it was observed that prosodic factors changed such that the general fundamental frequency of utterance declined gradually toward the end of an utterance, and the intensity decreased significantly in the final accentual phrase. However, it is not clear what prosodic features support the prediction. We focused on dependency structure among bunsetsu-phrases as the syntactic factor and investigated the relation between the phrase-dependency and prosodic features based on a spontaneous Japanese conversation corpus. The results showed that the average fundamental frequency and the average intensity for accentual phrases did not decline until the modified phrase appeared. This suggests the possibility that prosodic changes and phrase-dependency relations inform the hearer that the utterance is approaching its end.

5aSC9. Working memory facilitates the detection and correction of feedback errors in vocal pitch regulation. Hanjun Liu, Zhiqiang Guo, and Xiuqin Wu (Rehabilitation Medicine, The First Affiliated Hospital of Sun Yat-sen Univ., 58 Zhongshan 2nd Rd., Guangzhou, Guangdong 510080, China, lhanjun@mail.sysu.edu.cn)

In speech processing, information related to the speech motor command and sensory re-afference can be stored in working memory (WM) within a feedback circuit and recalled when needed to adjust the motor activity. Whether WM facilitates the online monitoring of speech motor control, however, remains unclear. The present event-related potential study sought to examine the impact of WM on the auditory-motor processing of pitch feedback errors. Participants sustained a vowel phonation while hearing their voice pitch-shifted +200 or +500 cents five times. In the WM task, participants were asked to determine whether the sequence of 5 pitch shifts was different or not between two consecutive vocalizations. In the control task, they did nothing but maintaining their vocalizations steady when exposed to pitch-shifted auditory feedback. The behavioral results revealed a significant increase of vocal responses in the WM task as compared to the control task. At the cortical level, the WM task elicited significantly larger N1 responses and smaller P2 responses than the control task. Taken together, these findings demonstrate the influence of WM on the neurobehavioral responses to pitch-shifted voice auditory feedback, indicating that WM can facilitate the detection and correction of pitch feedback errors in vocal motor control.

5aSC10. Effect of level difference between left and right vocal folds on phonation: Physical experiment and theoretical study. Ryo Shimamura (Graduate School of Sci. and Eng., Ritsumeikan Univ., Noji-higashi, 1-1-1, Kusatsu, Siga 525-0058, Japan, rt0021hf@ed.ritsumei.ac.jp) and Isao T. Tokuda (Graduate School of Sci. and Eng., Ritsumeikan Univ., Kusatsu, Shiga, Japan)

The vocal folds, which are constituted by muscles covered with a mucous membrane, generate a primary sound called the voice source, as airflow passes them. In some voice disorders, asymmetry between left and right vocal folds was observed. We focus on level difference, which is defined as the distance between the upper surfaces of the bilateral vocal