New Sounds 2019

Waseda University, Japan

早稲田大学
教育・総合科学学術院
Faculty of Education
and Integrated Arts
and Sciences

New Sounds 2019

Waseda University, Japan

International Symposium on the Acquisition of Second Language Speech
August 30 – September 1 2019

Abstract Booklet

Phonetic Society of Japan

Phonological Society of Japan

iLaSS — Waseda University Institute of Language and Speech Science

Waseda University
Institute of Language
and Speech Science

IBS — WORLD FAMILY'S INSTITUTE OF BILINGUAL SCIENCE
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Plenary Speeches

L2 speech perception, production and learning: What laboratory training studies have told us

Dr. Reiko Yamada, ATR

Cross-linguistic studies have shown that certain phonetic contrasts are extremely difficult to learn for speakers of some specific languages. However, training studies have demonstrated that laboratory training can improve the ability of adults to perceive and produce such difficult contrasts. For a typical example, studies that examined the perception and production of English /r/-/l/ by native speakers of Japanese are introduced in this paper. In the 1990s, a collaborative team made up of researchers from Indiana University and ATR reported that when native speakers of Japanese were trained on /r/-/l/ minimal pairs using an identification task with natural tokens, accuracy in perception significantly improved from pre-test to post-test, and the training effects were generalized to include novel speakers and novel words. After this paper, a series of training studies was conducted and additional results were obtained. Interestingly, all such results suggested the importance of phoneme acquisition in learning a new language. In order to conduct production training experiments, a technique to recognize and evaluate foreign accented speech was also developed. The theoretical and technological implications for effective foreign language learning methods will be discussed, and an application development utilizing these findings will be also introduced.

Plenary Speech 2

Exploring a new research agenda for second language speech learning

Prof. Pavel Trofimovich, Concordia University

In New Sounds' nearly 30-year history, beginning from the first meeting at the University of Amsterdam in 1990, the conference has become a major international event for researchers and practitioners interested in various aspects of speech learning and use. The conference now encompasses rich strands of theoretical and applied research, including (not limited to) speech perception and production, phonetics and phonology, technology, multilingualism, learning of second and additional language, as well as various methodological approaches to the study of speech learning and use. A 30-year conference anniversary is an important milestone, requiring both a look back to evaluate what has been accomplished as well as a look towards the future to identify exciting new research trends. In this presentation, I will take stock of several conceptual and methodological achievements by second language speech researchers in the past three decades. I will then turn to the future and provide a personal view of possible new (or rediscovered old) agendas for second language speech learning, highlighting the dynamic, variable, multifaceted, and multimodal nature of speech learning and use. Above all, I will highlight the importance of socially relevant research practices which are useful to the daily lives of language speakers.

Neural evidence for how experience shapes speech processing in first and second language acquisition

Prof. Valerie Shafer, Graduate Center, City University of New York

The last 20 or so years have led to a gradually-increasing number of neurophysiological studies focused on speech processing. Even so, the total number of studies, particularly those examining development of speech processing, is relatively small, when compared to the many studies focused on non-speech auditory stimuli. One goal of this talk is to advocate for more investigations of speech processing using these measures. The overarching goal of our laboratory has been to understand the neural mechanisms that underlie speech perception and to explain how speech experience shapes these underlying processes in first and second language learning. Our lab has contributed substantially to the existing knowledge on neural indices of speech. In this talk, I will illustrate the distinct contribution of neural information to our understanding of first and second language development. Several useful neurophysiological designs will be described. I then will present results from a range of studies, both completed and in progress, that are helping to build a picture of the underlying neural processes that support speech development in monolingual and bilingual children and in early and late second language learners. This "picture" indicates a hierarchical model, but with some parallel activation leading from encoding of information in auditory cortex to conscious awareness and perception. I will demonstrate that investigations of both first and second language speech processing give us insight into the general nature of how we process spoken language.

Oral Presentations, 30 August (11A1 – 13C2)

The acquisition of final obstruent (de)voicing in young multilingual language learners

Romana Kopeckova, University of Münster
Anna Balas, University of Poznan
Ulrike Gut, University of Münster
Roeland van Hout, Radboud University
Magdalena Wrembel, University of Poznan

Languages differ in the realization of coda obstruents. While English retains a voicing contrast in syllable-final position, this opposition is neutralized in German and Polish. Studies have shown that both Polish and German L1 speakers demonstrate low accuracy rates in producing final voiced obstruents in English (Flege & Davidian 1984; Wieden & Nemser 1991), but no longitudinal investigations have been conducted so far. Nor has it been tested how the acquisition of further languages might interact with learners' production of final obstruents. Based on the hypothesis of "connected growers" (de Bot, 2011), the present study examines whether L1 Polish and L1 German-speaking learners' production of final obstruents shows mutually influenced developmental paths in their L2 English and L3 German/Polish. A total of 23 learners (10 with L1 Polish and 13 with L1 German) aged 11-13, who had been learning English for 5-6 years at school and who were acquiring German or Polish as an L3 were recorded three times over the first year of their instructed L3 acquisition. In all three of their languages, they produced a total of 2932 syllable-final obstruents in three tasks (picture naming, delayed repetition and story telling). These tokens were analysed auditorily by six phonetically trained raters. Linear mixed effect modelling showed that the L1 Polish multilinguals produced no significant differences in the devoicing rate of word-final obstruents between their languages at all testing times, while the L1 German children demonstrated significantly more devoicing in English at T1 and a significant increase of devoicing in Polish at T2. However, both learner groups showed a comparable degree of (de)voicing in both their L2 and L3 at T3, which was significantly different from their L1. The results demonstrate mutual influence of the children's languages, with the group differences probably caused by task effects.

Topics: Bilingualism and multilingualism, Consonant production

Liaison or Spelling Pronunciation? - A Corpus Phonological Analysis of French as a Foreign Language

Elissa Pustka, University of Vienna
Julia Forster, University of Vienna
Julia Kamerhuber, University of Vienna

One of the biggest challenges in French phonology – for learners as well as for linguists – are word final consonants. Generally being omitted from the 12th century onwards, etymological spelling was reintroduced by grammarians (relatinization). Consequently, learners have to memorize differences in pronunciation, e.g. cognac with final [k], tabac without. Things are getting particularly difficult when it comes to liaison, which consists of a consonant/zero alternation depending on the phonotactic and socio-stylistic context (e.g. les amis 'the friends' [lezami]).

Thus, the major methodological difficulty in analyzing L2 data is to distinguish whether learners realize a liaison without resyllabification or a final consonant suggested by orthography. We will study this question based on about 110 hours of learner French coming out of the Pro2F project that provides recordings (repetition, reading and spontaneous speech) of 145 Austrian pupils.

First results in textreading show that 12% of our learners realize a final consonant within ils[s] veulent 'they want', which is not a liaison context in L1 French. Within the obligatory liaison context ils [z]aiment 'they love', 37% of the learners produce a consonant. However, only in 18% of the cases, our learners produce a correct liaison (correct quality of the liaison consonant [z] and resyllabification). In the other cases, the consonant is devoiced and/or the resyllabification is missing. Although one might assume non-resyllabification and/or false consonants are an artifact of reading tasks, our corpus demonstrates that they also appear in spontaneous speech, which indicates that students might have fossilized the visual input. However, it remains unclear how such word final consonants turn into liaison consonants, which are more frequently used with increasing proficiency levels. In order to provide a more reliable interpretation of our learners' productions, an analysis of their individual idiolects will be conducted in a further step.

Topics: Consonant production, Intelligibility and comprehensibility

"Light or Night?" -- Alternation of [n] and [l] for Chinese English Language Learners

John Levis, Iowa State University

Wei Zhang, Qufu Normal University

Southwestern Mandarin is one of the most important dialects of modern Chinese, with over 250 million speakers. Unlike most Mandarin varieties, its most noticeable characteristic is the lack of distinction between /n/ and /l/. The confusion, when transferred into learning English, risks loss of intelligibility because its high functional load is the same as /l/-/ɹ/, the most studied contrast in English pronunciation. Unlike /l/-/ɹ/, knowledge of likely environments for confusion of /l/-/n/ in L2 English is almost nonexistent.

This study examines when the /l/-/n/ distinction in English is not maintained by speakers of Southwestern Mandarin. Twenty-five Southwestern Mandarin speakers recorded 115 English words containing /l/ and /n/ twice each. Each word contained /n/ and /l/ in initial, medial, and final position. They also recorded words in which /n/ and /l/ were in the same word (/n/ before /l/ and vice versa). All tokens were coded for accuracy by the researchers. Results showed that the pronunciation of /n/ and /l/ in English words varied according to environment. When the sounds were in final position, and the likely pronunciation involved segment deletion.

The results further show that substitutions occurred most in syllable-initial position, and that /n/ was substituted for /l/ more than /l/ for /n/. When both sounds occurred in the same word, words with /l/ before /n/ had a higher error rate. In addition, a less common variation was for [l], [n] and [ɹ] to substitute for one another. This happened for Southwestern Mandarin speakers, and for subjects from Cantonese and Xiang Chinese. As more Southwestern Mandarin speakers study abroad in English medium universities, these results help us understand how the /l/-/n/ contrast can be addressed in spoken language instruction. The study also suggest how research on intelligibility of /l/ and /n/ for English learners from Southwestern Mandarin can be pursued.

Topics: Consonant production, Intelligibility and comprehensibility

Presentation Session: 11B1

Examining the acoustic and temporal measures underlying self- and other-assessment of accentedness

Aki Tsunemoto, Concordia University
Talia Isaacs, University College London
Kim McDonough, Concordia University

In the fields of psychology and education, self-assessment has received extensive attention as a metacognitive strategy for autonomous skill development. However, research shows people often fail to self-assess their performance in line with other-assessment (Kruger & Dunning, 1999). In second language (L2) pronunciation research specifically, some studies have revealed alignment between self- and other-ratings of pronunciation accuracy (Dlaska & Krekeler, 2008; Lappin-Fortin & Rye, 2014), while other research has reported a mismatch in accentedness ratings (Trofimovich et al., 2016).

Due to the importance that some L2 speakers ascribe to attaining non-accented pronunciation (Derwing et al., 2003; Tokumoto & Shibata, 2011), the current study compares self- and other-assessments of accentedness in a foreign language setting. The study further probes which prosodic and fluency-related features of L2 speech are most salient to raters by investigating which acoustic and temporal measures underlie self- and other-ratings of accentedness.

Japanese secondary school students (N = 63) were audio-recorded while carrying out a 69-word read-aloud task and subsequently provided self-ratings of accentedness using a 9-point scale. Eight native English listeners rated the set of speech samples for accentedness using the same scale. The speech samples were then analysed for temporal (e.g., speech rate and pauses) and suprasegmental (e.g., word stress and pitch) measures using speech analysis software. Preliminary correlation results revealed no relationship between the Japanese speakers' self-rating and the native listeners' accentedness ratings, which suggest that there are possible discrepancies underlying self- and other-ratings. Multiple regression models will identify which acoustic and/or temporal measures predict self- and other-ratings of accentedness. Implications for teaching L2 pronunciation will be discussed in terms of how speakers' self-assessed accentedness may differ from ratings of native English listeners.

Topics: Cross-language and nonnative perception, Intonation, Psycholinguistics, Stress and accent

Examining Phonetic and Phonological Effects of the Native Intonational System on Second-Language
Speech Segmentation

Annie Tremblay, University of Kansas
Seulgi Shin, University of Kansas
Sahyang Kim, Hongik University
Taehong Cho, Hanyang University

This study investigates how phonetic and phonological aspects of the native-language (L1) intonational system modulate the use of tonal cues in second-language (L2) speech segmentation, focusing on French and English listeners' segmentation of Korean.

(Seoul-)Korean has an Accentual Phrase (AP) with a L(HL)H tonal pattern for APs beginning with a lenis segment (Jun, 1998), with the AP-initial L tone being closely aligned with the AP-initial syllable. French has a similar AP (Jun & Fougeron, 2002), but in French the AP-initial L tone is not closely aligned to the AP-initial syllable (Welby & Loevenbruck, 2006). In contrast, nuclear-pitch-accented English words with initial stress (the most frequent stress pattern; Cutler & Carter, 1987) often begin with an H tone (Beckman, 1986; Pierrehumbert & Beckman, 1986).

Korean listeners and proficiency-matched French and English learners of Korean completed an eye-tracking experiment, with auditory sentences containing a temporary ambiguity between an AP-initial target (saesinbu-ga]AP [masul-eul 'the-new-bride-subj magic-obj') and a disyllabic competitor spanning the AP boundary (gama 'palanquin'). Stimuli were resynthesized to orthogonally manipulate the AP-final and AP-initial tones (H/L).

Korean, French, and English listeners' overall target-over-competitor fixation advantage (400-1,400 ms) showed an enhancing effect of AP-final H tone (relative to the AP-final L tone; expected for Korean); however, unlike French and Korean listeners, English listeners' early target-over-competitor fixation advantage (200-800 ms) showed an enhancing effect of AP-initial H tone (relative to the AP-initial L tone; unexpected for Korean), with the effect reversing thereafter (800-1,400 ms).

These results suggest that: (i) phonetic differences between the L1-L2 intonational systems (French-Korean) may not hinder L2 speech segmentation when the L2 prosodic tones are closely aligned with L2 word boundaries (cf. Tremblay, Broersma, Coughlin, & Choi, 2016); (ii) phonological differences between the L1-L2 intonational systems (English-Korean) may have persistent effects early in the time course of L2 lexical access.

Topics: Cross-language and nonnative perception, Intonation, Psycholinguistics, Stress and accent

‘English Japanese’: Why every English speaker produces Japanese pitch accent differently and no one uses Standard Japanese

Becky Muradás-Taylor, York St John University

This study investigates Standard Japanese pitch accent production in L1 English-speaking learners, asking how accuracy/stability vary with amount of Japanese experience and between learners.

Pitch accent – the difference between initially-accented hashi ‘chopsticks’ and finally-accented hashi ‘bridge’ – correlates with perceived foreign accent (Idemaru et al., 2018). L1-English speakers vary in how accurately they identify accent types (Goss, 2015). Individual variation is also prevalent in production – some learners accent the penult and others produce words unaccented (Kuno, 1998; Taylor, 2011). Even the relation between accent type and factors such as lexical class varies between learners (Taylor, 2011). However, it is unknown whether some learners produce more accurate and stable accent types than others.

Two groups of L1-English L2-Japanese learners (13 less- and 8 more-experienced) produced 180 words in three contexts, e.g. ame ‘rain’, ame da ‘it’s rain’, and ame ga furu ‘rain falls’. Three contexts were used since previous research (e.g. Yamada, 1994) reported accent type changes with context. Three Japanese phoneticians identified the accent types, with good inter-rater reliability (Krippendorff’s alpha 0.69).

The results showed no difference in accuracy between groups ($\chi 2(1) = 0.01$, $p = 0.9$) and little inter-learner variation (mean 43%, SD 5) – all learners had low accuracy. Stability showed no variation between groups ($\chi 2(1) = 1.25$, $p = 0.3$), and although some learners had high stability, they had a dominant accent type and did not maintain accent type contrasts across contexts. It is concluded that no learners produce accurate and stable accent types.

This finding is contrasted with previous research to explore the question in the title. It is argued that although some English speakers perceive Japanese pitch accent accurately, they do not produce it accurately, because they do not encode it in long-term memory. This raises questions regarding intelligibility and functional load.

Topics: Stress and accent

Effects of Exposure to Phonetic Segments on Non-native Perceptual Development

Hiroki Fujita, Univerisity of Reading

Ruri Ueda, Osaka Kyoiku University

Ken-ichi Hashimoto, Osaka Kyoiku University

Previous studies have shown that non-native (L2) speakers' identification or discrimination performance improves after a certain amount of perception training (e.g., Bradlow, Pisoni, Akahane–Yamada, & Tohkura, 1997). Yet, little has been explored concerning whether and how L2 perceptual ability develops by mere exposure to L2 phonetic segments (see Fujita, Ueda, & Hashimoto, 2018). To explore this issue, we examined whether Japanese language learners of English (n = 31) adapt to the English phonetic contrasts /l/-/r/ and /ɑ/-/ʌ/ that pose perceptual difficulty for them during an identification task. Adaptation is known as a form of learning (e.g., Kleinschmidt & Jaeger, 2015) and thus may be used as an index of L2 perceptual development. In the identification task, participants listened to a word followed by two visual probe words and judged which of the visually presented words matched the aurally presented word. To quantify perceptual adaptation processes, we measured comprehension accuracy rates and response times to the identification questions and divided the task into four blocks to assess how these measures change over the course of the task as in previous studies (e.g., Clarke & Garrett, 2004). The same set of minimal pairs was adopted for Blocks 1-3 while Block 4 consisted of a different set of minimal pairs to examine whether L2 perceptual adaptation occurs across words containing globally different phonological properties. For data analysis, we fit linear mixed models to response times and generalised linear mixed models to accuracy rates. Data analysis revealed that response times were reduced across the blocks, showing adaptation. Accuracy rates did not change significantly. These results suggest that L2 speakers adapt to difficult-to-identify phonetic contrasts rapidly as native speakers do (e.g., Clarke & Garrett, 2004), but mere exposure to them does not necessarily lead to global improvement in perception ability.

Topics: Bilingualism and multilingualism, Consonant perception, Psycholinguistics, Training, Vowel perception

Presentation Session: 11C2

Updating the lexical encoding of L2 phonological contrasts: effects of lexical and non-lexical HVPT on L2 speech acquisition.

Joan C. Mora, Universitat de Barcelona
Ingrid Mora-Plaza, Universitat de Barcelona

High-variability phonetic training leads to robust gains in L2 learners' discrimination and production of L2 sound contrasts (Cebrian & Carlet, 2014; Iverson, Pinet, & Evans, 2012), but it is currently unknown whether such benefits extend to the lexical encoding of phonological contrasts (Darcy et al., 2012) and result in effective pronunciation improvement. This study examined the differential effects of two high-variability phonetic training procedures on the lexical encoding and pronunciation of English /æ/-/ʌ/ for adult Spanish-Catalan EFL learners.

Participants were randomly assigned to two groups differing in the lexical status of the training stimuli. Whereas one group was exclusively trained on nonwords (N=14), the other was trained on words (N=12). They were trained in 4 x 45-minute sessions on the perception and production of English /æ/-/ʌ/ through identification, AX discrimination, and immediate repetition tasks. Gains in lexical encoding were assessed through a lexical decision task, whereas pronunciation improvement was assessed by computing spectral distance scores between trainees and native speakers' productions of /æ/ and /ʌ/ untrained minimal-pair words embedded in sentences elicited through a meaning-focused delayed repetition task. A control group (N=15) was also pre- and post-tested, but did not do the training.

The results revealed gains in lexical encoding (correct identification of test nonwords) for /æ/ for both training groups, whereas only the group trained with nonwords improved on /ʌ/. The control group did not improve on /ʌ/, and improved to a lesser extent on /æ/ than experimental groups. In production, only participants trained on nonwords reduced their /æ/ and /ʌ/ spectral distances from native speakers. These findings suggest that training L2 learners with high-variability non-lexical speech materials (nonwords) leads to larger gains in the lexical encoding of difficult L2 vowels and in the production of these vowels elicited in sentences. Implications for pronunciation teaching will be discussed.

Topics: Psycholinguistics, Training, Vowel perception, Vowel production

The effects of training with visual monitoring on L2 vowel production

Cristina Aliaga-Garcia, UNIVERSITY OF BARCELONA

Pace Bailey, UNIVERSITY OF BARCELONA

Audiovisual stimuli have proved superior to auditory-only stimuli in perceptual training, leading to larger gains in pronunciation (Hazan et al., 2005). Previous production training studies have shown that visual feedback is effective in activating L2 learners' feedback sensory systems, leading to error detection and rapid motor adjustments (Kartushina et al., 2015). However, no research to date has examined the role of visual monitoring (e.g. observing one's own lip-movement gestures) during production training.

The current study investigated the effectiveness of visual monitoring (VM) as a production training method with a focus on English /æ/ and /ʌ/, two vowels Catalan/Spanish EFL learners typically fail to distinguish qualitatively in production, over-relying on duration differences (Cebrian, 2006). Participants were randomly assigned to two training groups, either with (N=11) or without (N=14) visual monitoring. The training was administered over 4x45min sessions consisting of a listen(1)-repeat(1)-listen(2)-repeat(2) immediate repetition task with non-words, preceded by discrimination and identification tasks. During training, all participants heard themselves repeat the target non-words twice after a native speaker model, but only the VM group could watch their lip gestures on a screen monitor during the task. Production gains were assessed through a 76-trial delayed repetition task, consisting of minimal-pair words and non-words targeting the /æ/-/ʌ/ contrast. Production accuracy measures of vowel quality and duration were spectral distance and duration difference scores.

The results revealed a clear advantage of the VM group reflected in a significantly larger spectral distance between /æ/ and /ʌ/ at post-test irrespective of word type (words/non-words), and a significant decrease in duration difference for non-words. In the absence of VM, there was a noticeable increase in duration distance. Performance trends for the VM group suggest that visually monitoring one's articulatory gestures during production training is effective in making contrasting L2 vowels qualitatively more distinct, while relying less on duration.

Topics: Training, Vowel production

Presentation Session: 12A1

Evaluating the Lingua Franca Core and relative functional load based on Swedish listeners' perception
on second language speakers' English phoneme realisation

Hyeseung Jeong, University West
Bosse Thorén, University West

In teaching and assessing pronunciation of English as an international lingua franca (ELF), intelligibility is more relevant than nativelikeness (Jenkins, 2015). As guidelines for intelligible ELF pronunciation, the Lingua Franca Core (LFC) syllabus (Jenkins, 2002) and relative functional load (FL) of phonemic contrasts (e.g., Catford, 1987) have been used (e.g., Jeong et al., 2018; Rahimi & Ruzrokh, 2016; Sewell, 2017).

The paper examines phonemic details in the LFC and relative FL, based on the intelligibility of second language speakers' phoneme realisation for Swedish university students. Using the perception of a group of Swedish youths for the study can be rationalised that they are known to have very high proficient English skills as a second language (Norrby, 2015). Speech data with IPA transcriptions were from the Speech Accent Archive (http://accent.gmu.edu/index.php), comprising nine speakers' readings of the same text, whose first languages were Arabic, French, German, Japanese, Russian, Somali, Thai, Turkish and Urdu respectively. Each of seventy-five Swedish students taking university courses chose and transcribed one of the nine speakers in English orthography. Through comparing errors in the listeners' transcriptions, their accounts, and the speakers' segmental features deviating from either American or British English phoneme inventory, we firstly analysed whether, and to what extent such deviation affected intelligibility. From this analysis, some details of the LFC and relative FL were questioned. For example, while the LFC denotes that all consonants besides interdental fricatives need to be realised as in Standard American/British English, replacing some consonants with others, like plural marking /z/ with /s/ or alveolar /ɹ/ with uvular / ʁ/, did not compromise intelligibility. Likewise, while the ɔ/oʊ contrast is known to have high FL, replacing one with the other did not cause misunderstanding (e.g. realising 'only' as [ɔnli]). The findings suggest further scrutinising and developing the LFC and relative FL.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception, Intelligibility and comprehensibility, Vowel perception, Vowel production

Cultural difference of the perceptual concept for Japanese social affects using a new free description approach

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Various socio-affective meanings are conveyed by vocal prosody and visual gesture. Research on social affects also provided information about the perception of affective expressions in different languages (Scherer & Wallbott, 1994). However, most research on this topic are based on force-choice paradigms, presenting given sets of labels and their translations in several languages, an approach which might introduce biases because of variations in "folk labels" conceptualization (Wierzbicka,1992). The aim of this paper is twofold: 1) using a free labeling approach to avoid any pre-conceptualization imposed through labels selection and translation, 2) providing a cross-cultural comparison of the perceptual categorization of such expressions by Japanese and French participants interpreting expressions produced by L1 Japanese speakers. Participants were asked to describe by one word the intended expressions of videotaped speakers uttering small phrases in 16 different social interactions. Similarities and differences between the interpretation of Japanese and French participants are described in terms of the clustering of the situations obtained from a multidimensional analysis of the obtained labels. The classification shows that two main clusters emerged from both groups of subjects, one that may be described (according to the majority of given labels) as containing "assertive" expressions, while the second is described as "interrogative" – a bipartition that recalls Brandt proposal for prosodic meaning (Brandt, 2008). Finer distinctions show an opposition between polite and imposition expressions within the assertive cluster. Both French and Japanese subjects showed similar perceptual classification patterns for expressions of surprise, irony and Kyoshuku–a typical Japanese expression. The labels used to define some situations however show cultural specificities, especially for irony an expression negatively connoted for Japanese participants while French participants associate it to humorous or comical meanings. This free-labeling approach revealed cultural nuances that a forced-choice paradigm misses, asserting its relevance to the study of cross-language changes.

Topics: Attitude and identity, Audiovisual processing, Cross-language and nonnative perception

Presentation Session: 12A3

How to predict discriminability of phonemic length contrasts: Categorization and perceptual similarity of Finnish length by Japanese and American English listeners

Ryan Lidster, Indiana University Bloomington
Danielle Daidone, Indiana University Bloomington
Lila Michaels, Indiana University Bloomington
Aaron Albin, Kobe University

The Perceptual Assimilation (PA) task is frequently used to predict the discriminability of non-native contrasts. However, this task relies on the existence of L1 categories onto which non-native sounds can be mapped, which effectively renders the task inapplicable in cases where the L1 lacks a set of phonological categories that can be used as labels. For example, a PA task cannot be used to predict the discriminability of Finnish length contrasts for L1-English listeners, since English has no lexical contrasts based on length (hence no suitable labels for use in a PA experiment). The present study explores to what extent this problem can be circumvented by instead predicting discrimination (as measured by an oddity task) using two alternative tasks: (1) a forced-choice identification task based on the original PA task design, and (2) a free classification task (Clopper, 2008), in which participants grouped stimuli based on their perceived similarity to each other. This set of tasks was applied to test how 10 different consonant and vowel length contrasts in Finnish nonce words (e.g. pata~patta or pata~paata) were perceived by 29 American English and 27 Japanese listeners, where only the latter group's L1 has similar length-based contrasts. As expected, only the Japanese listeners perceived the length distinctions categorically (with the exception of the Finnish CV:C:V: pattern, which is phonotactically illegal in Japanese). Crucially, overlap scores from the identification task and perceptual distances from the free classification task were both strongly correlated with discrimination performance in the oddity task (r=0.77~0.94, depending on L1 group and task). Thus, we conclude that, at least for length contrasts, forced-choice identification and/or free classification can not only serve as viable alternatives to PA tasks in predicting discriminability, but they are also free of PA tasks' constraints.

Topics: Consonant perception, Cross-language and nonnative perception, Psycholinguistics, Vowel perception

Big data suggest strong constraints of phonological similarity on adult language learning

Roeland van Hout, Free University Berlin
Job Schepens, Free University Berlin
T. Florian Jaeger, University of Rochester

When adults learn new languages, their speech often remains noticeably non-native even after years of exposure. Many factors (e.g., age-related, cultural, educational, or socio-economic) have been found to contribute to a learners' proficiency in the new language. We examined a factor that is outside of the control of the adult learner, linguistic similarities between the learners' native language (L1) and the new language (Ln) (cf. Jarvis & Pavlenko, 2008; Lado, 1957; Flege 2003; Escudeiro 2005). Our approach is based on the analysis of many L1's (Flege (2003) points out the urgency of such an approach).

We analyzed data from the official State Exam of Dutch as a second language (B2). These data include speaking proficiency test scores of $\pm 50,000$ Ln learners of Dutch with 62 diverse L1s.In order to assess whether the effects of language background on Ln speaking proficiency are indeed due to learners' L1 background, we investigated the effect of linguistic similarities between the learners' L1 and Ln Dutch. We found that the L1 background accounts for a substantial proportion of variance in proficiency ($\pm 17\%$) and that almost 75% of this effect can be explained through three measures of L1-Ln linguistic similarity.

We focus on the effects of phonological similarity while including controls for morphological and lexical similarity. We computed phonological similarity measures, using the PHOIBLE database (Moran, McCloy, & Wright, 2014), between the sound inventories involved and between their phonological features (cf. Hayes, 2011; Moran & Wright, 2009). Specifically, we found that subcategorical properties of new sounds (phonological features) better account for the variation in speaking proficiency scores compared to new sounds only. In line with previous studies on just two to three L1-L2 combinations at a time, we systematically find constraint effects, but we go beyond these studies by quantifying the effect size of phonological similarity.

Topics: Bilingualism and multilingualism, Consonant production, Psycholinguistics, Vowel production

Presentation Session: 12B2

The role of underlying linguistic knowledge and task characteristics in L2 oral fluency

Shungo Suzuki, Lancaster University

Second Language (L2) speech research has explored the relationship between utterance fluency and its underlying linguistic knowledge and processing–cognitive fluency (De Jong et al., 2012). Accordingly, scholars have established theoretical models explaining how psycholinguistic processes are realized in utterance behaviours including pausing and false starts (e.g., Kormos, 2006; Segalowitz, 2010). It is, however, still unclear the extent to which the relationship between utterance and cognitive fluency varies in relation to speech processing demands. The current study, therefore, investigated the role of underlying linguistic knowledge in L2 utterance fluency, using two speaking tasks which differ in speech processing demands.

A total of 66 Japanese-speaking learners of English were recruited at a university in Japan. Their speaking performance was elicited via an argumentative task and picture narrative task and analyzed by utterance fluency measures (e.g., mid- and final-clause pause ratio). Meanwhile, their linguistic knowledge and processing skills were measured by a range of tests respectively tapping into vocabulary, grammar, and pronunciation. Moreover, their orientation toward speaking performance (e.g., accuracy- vs. fluency-oriented) was also assessed by a 6-point scale questionnaire (Suzuki, 2018).

A series of stepwise multiple regression analyses revealed that speed and repair fluency aspects were associated with common predictor variables regardless of speaking tasks. However, different predictor variables explained the underlying linguistic dimensions of breakdown fluency across speaking tasks. Specifically, mid-clause pauses in the argumentative speech were associated with learners' syntactic processing skills whereas those in the picture narrative were associated with their orientation toward lexicogrammatical accuracy. Meanwhile, final-clause pauses in the argumentative speech were related to the orientation toward lexicogrammatical sophistication while those in the picture narratives were related to vocabulary and grammatical knowledge. These findings may suggest that L2 speech processing underlying pausing behaviours needs to be interpreted with regard to the speaking task characteristics.

Topics: Psycholinguistics, Teaching and assessment

Learning the form of words in a new dialect can be as challenging as in a new language

Franziska Krüger, Indiana University Bloomington

The perception of foreign sounds is warped by the phonemic categories established for our native language (L1) and our lexical activation patterns reflect language-specific knowledge (Flege, 2007). Furthermore, some studies report dialect-specific processing patterns for speakers of native varieties (Sumner & Samuel, 2009). Little is known about the acquisition of new varieties in terms of perception and lexical representations, as most studies have focused on speech production. For learners of a new dialect with a typologically similar phonology, learning to perceive and to lexically re-encode familiar words might be easy. Yet, learning new but similar categories has been shown to be impeded by the L1. We ask how second dialect (D2) learners perceive and lexically represent D2 words when the native (D1) and D2 phonologies are similar.

We investigated how dialect speakers of a German variety (Upper Saxon) process the standard German labial /b/-/p/ and velar /g/-/k/ contrasts. These pairs create lexical contrasts in standard German but have merged into /b/- and /g/-like sounds in Upper Saxon. 40 German native speakers were divided into three groups based on geographical history and early linguistic input: standard German speakers (N=21); dialect speakers having lived only in D1 areas (remainers, N=11); and dialect speakers who moved into a region with the voicing contrast after age 14 (movers, N=8). On an oddity discrimination task, standard speakers significantly outperformed both dialect groups. When compared to remainers, this was true for the labial and velar contrast; movers were less accurate only on the velar contrast. On a lexical task, the groups did not differ in accuracy. The mover group, however, was significantly slower than the standard speakers.

Our results indicate that even for typologically similar phonologies, learners' phonemic categories can be imprecise. The results also provide new data for modeling the acquisition of new sound systems.

Topics: Bilingualism and multilingualism, Consonant perception, Cross-language and nonnative perception, Psycholinguistics

Presentation Session: 12C1

The Roles of Cognitive and Sociopsychological Individual Differences in the Effectiveness of Explicit Phonetic Instruction in Second Language Pronunciation Development

Yui Suzukida, University College London
Kazuya Saito, University College London

Over the 50 years, the effectiveness of explicit pronunciation instruction has been investigated extensively (Thomson & Derwing, 2015). While there is ample evidence that pronunciation instruction generally promotes students' L2 speech acquisition, their outcomes appear to be subject to a great deal of individual variability. A growing number of scholars have argued that the extent to which students can actually benefit from any type of instruction could be uniquely related to a set of sociopsychological (e.g., motivation and anxiety: Boo et al., 2015) and cognitive factors (e.g., aptitude and working memory: DeKeyser, 2012).

In the context of 51 Japanese learners of English, the current study examined how L2 learners with different individual difference (ID) profiles improve their pronunciation proficiency over one semester of pronunciation instruction. Their pre- and post-test spontaneous speech were holistically analysed via two constructs¬–accentedness and comprehensibility. Subsequently, their gain scores in these constructs were linked to their individual differences in aptitude (phonemic coding, associative memory, and sound recognition via LLAMA: Meara, 2005), music aptitude (Ogawa, 2009), and motivation and anxiety (measured via LAMP inventory: Sardegna et al., 2014), and L2 experience (measured via Language Contact Profile: Freed et al., 2004).

The results of statistical analyses showed a significant group improvement in comprehensibility resulting from explicit phonetic instruction and increased L2 experience outside classrooms¬¬. In contrast, improvement in accentedness was insignificant, suggesting that accent may be resistant to change in a relatively short period of intervention. The findings support the significant role of cognitive (aptitude) and sociopsychological (motivation) ID profiles especially in L2 comprehensibility, providing empirical evidence to the view that L2 learners can improve the comprehensibility aspects of speech regardless of their foreign accentedness (Derwing & Munro, 2015).

Topics: Intelligibility and comprehensibility, Teaching and assessment

Pronunciation errors by German L2 Danish learners: Ratings in accentedness, comprehensibility and acceptability

Lisa Tulaja, Christian-Albrechts-Universität zu Kiel (Institute for Scandinavian Studies, Frisian Studies and General Linguistics)

Due to geographical and historical reasons Danish is taught as a foreign language in schools in Northern Germany. Teaching Danish pronunciation, however, faces two major obstacles: First, Danish has a highly complex sound system (Grønnum 2009) that proves hard to acquire. Second, L1 speakers exhibit a relatively low degree of tolerance for variation as compared to the standard variety (Kristiansen 2009). In order to communicate successfully in L1 conversations a relatively high competence in pronunciation is needed. Yet, this area is widely unexplored, leading to a school curriculum which lacks evidence-based recommendations regarding pronunciation.

The aim of this PhD project was to discover those phonetic phenomena that affect communication in the target language Danish most. One hundred ninety-two Danish L1 native speakers rated 23 stimuli of L2 Danish produced by German learners. The stimuli were based on read-aloud short sentences, each including one prominent pronunciation error. In line with Thomson's (2018) proposal, the errors were not only tested for accentedness and comprehensibility (Munro & Derwing 1995; Derwing & Munro 2015) but also for acceptability, which was defined as a context-dependent, social dimension of non-normative speech, causing L1 rater reaction (Chang Li-Ann 2008; Pilott 2016; Settinieri 2011).

While almost all errors achieved high values in accentedness, their ratings varied in the two other dimensions. The similar – yet differing – results for acceptability and comprehensibility ratings give reason to assume that both correlate somehow but nonetheless should be regarded as dimensions of their own. The presentation focuses on the design and the results of the study as a contribution to research on acceptability and will discuss recommendations for L2-pronunciation teaching in general and for the curriculum for Danish as an L2 in particular.

Topics: Intelligibility and comprehensibility, Sociophonetics, Teaching and assessment

Presentation Session: 12C3

Multimodal corrective feedback on the prosodic accuracy of L2 learners of Chinese

Chun-Mei Chen, National Chung Hsing University

This study investigates how multimodal corrective feedback inputs, including verbal and visual resources, enhance prosodic accuracy of second language learners of Mandarin Chinese. Corrective feedback of phonological errors in second language classrooms has been less studied, not to mention multimodal inputs in classroom contexts and in the laboratory training. This study makes attempts to address, in addition to the acquisition of Mandarin tones of second learners of Chinese, the efficacy of multimodal corrective feedback on the prosodic accuracy in L2 classrooms of Mandarin Chinese. Investigation questions include how L2 learners of Mandarin Chinese apply the Third Tone Sandhi Rule and produce the target form in their spontaneous speech and elicitation with and without multimodal corrective feedback, and how the forms and functions of the verbal and visual corrective feedback interplay in L2 classrooms.

In the present study, production data of L2 learners were drawn from both laboratory recordings and beginning-level L2 Mandarin language classrooms. The participants were 30 Thai-speaking and Japanese-speaking learners of Chinese. The prosodic accuracy was examined through the recordings of the L2 learners' elicitation and speech. The study adopted a combination of an acoustic analysis on the entire dataset and human rating method. Results indicate accuracy rate of the production with verbal corrective feedback inputs gradually reduced from Week 6 to Week 8. On the contrary, the accuracy rate of the production with gestural corrective feedback inputs increased from Week 4 to Week 8. Measurements from the prosodic tokens of the L2 learners have indicated that prosodic accuracy is associated with visual and gestural corrective feedback. It was found the practice of grouping prosodic units with explicit gestural corrective feedback reduced the number of deviant tokens. The integration of multimodal analysis in L2 learners' speech facilitated tonal acquisition and prosodic accuracy of the L2 learners.

Topics: Lexical tones, Teaching and assessment

The effect of L2 experience in native Korean learners' perception and production of L2 English vowels

Shinsook Lee, Korea University
Mi-Hui Cho, Kyonggi University

The study investigates the effect of L2 experience on the perception and production of L2 English vowels by native Korean learners in the UK focusing on the interface between perception and production. The Korean learners were assigned to two groups of 12 each according to Age of arrival (AOA) and Length of Residence in the UK (LOR); more experienced group (mean AOA: 15.7 years, mean LOR: 7.3 years) vs. less experienced group (mean AOA: 24.3 years, mean LOR: 2.4 years). Vowel perception was examined using an identification test in which the Korean learners identified vowels they heard among English vowel stimuli in a bVt frame (beat, bit, bait, bet, bat, but, burt, bart, bot, bought, boat, boot) spoken by native British English speakers. Vowel production accuracy was examined through an intelligibility test in which native British English listeners identified vowels spoken by the Korean learners. The results showed that the more experienced Korean learners perceived and produced English vowels more accurately (89% and 83%) than the less experienced Korean learners (67% and 70%). This finding reveals that L2 experience plays an important role in L2 vowel perception and production (Flege et al., 1997). The significant precedence of perception over production and also correlation between perception and production was observed only for the more experienced Korean learners ($t(11)=2.895$, $p<.05$; $R^2=0.396$, $p<.05$). The results suggest that how accurately L2 vowels are perceived guides how accurately they are produced for more experienced L2 learners. The results further imply that more experienced L2 learners' perceptual abilities are connected to their L2 production abilities unlike less experienced L2 learners. However, individual variations are observed across the two groups, although similar error patterns in perception and production are obtained. The different individual learning paths for L2 vowels are discussed based on learner variables (Trofimovich et al., 2015).

Topics: L2 effects, Intelligibility and comprehensibility, Vowel perception, Vowel production

Presentation Session: 13A2

How Dutch high-school pupils cope with German reduced speech

Karin Wanrooij, Leiden University, Leiden, the Netherlands
Maartje Raijmakers, Free University, Amsterdam, the Netherlands

When speaking naturally, native speakers delete and merge speech sounds within and across words. For instance, German native speakers may say "hama" [hamɐ] instead of the full pronunciation "haben wir" [haːbən viːɐ] 'we have' (literally 'have we'). Such reductions challenge second-language learners (e.g., Dutch learners of German), who often do not recognize any word or recognize a wrong word (e.g., *Hammer* 'hammer'). We examined how Dutch high-school pupils perceive and understand German reduced speech, after four years of training in German as a second language.

For this, 39 Dutch (and 38 German) adolescents listened to either reduced or unreduced short phrases (dictation task; 48 trials) and words (lexical decision; 80 trials), representing simple well-known vocabulary. Accuracies in both tasks were dramatically lower for pupils presented with reduced speech than for those presented with unreduced speech, thus demonstrating that Dutch pupils still struggle with simple German reduced speech even after four years of high-school training.

An inspection of error types in the dictation task showed that pupils listening to reduced speech segment the phrases incorrectly more often and delete and substitute targets more often, than pupils listening to unreduced speech. The errors also suggested that most pupils apply multiple 'listening strategies'. For instance, many of them substituted targets by non-words (indicative of a 'bottom-up' strategy) *and* by other words not intended by the speaker (indicative of a 'top-down' strategy). Outcomes will be discussed in the context of practices in Dutch classrooms, as observed in a concurrent, nation-wide questionnaire among teachers.

Topics: Age effects, Cross-language and nonnative perception, Teaching and assessment

Difficulty in acquiring L2 tones: insights from the incidental learning of tone-segment mappings

Ricky Chan, The University of Hong Kong

A major obstacle in learning tone languages (e.g. Mandarin and Cantonese) lies in lexical tones (contrastive pitch patterns for distinguishing word meaning). Most previous research on L2 tone acquisition has focused on explicit processes such as L2 tone discrimination/identification, and whether learners tonal background and prior musical training may facilitate L2 tone perception. However, the ability to identify/discriminate different L2 tones does not entail the ability to form abstract tone categories at the word level, a prerequisite for using tone categories as lexical cues. For learners whose native language is non-tonal, a long-term difficulty in learning novel tones may concern repurposing pitch patterns from intonation cues to the formation of tone categories at the word level. This hypothesis was tested with an experiment on the incidental learning of artificial tone-segment mappings (constraints by segmental composition on the possible tone a given word can carry) (e.g. words beginning with an aspirated stop (e.g. /ph/, /th/ or /kh/) carry a rising tone). This avoids confounding factors in previous research such as lexical knowledge and contextual tonal effects. The learning of these mappings hinges on the encoding of pitch patterns as abstract tone categories at the syllable level.

80 subjects (20 Cantonese musicians, 20 Cantonese non-musicians, 20 English musicians, and 20 English non-musicians) participated in the study. Results show that while the four subject groups performed similarly well in tone discrimination, Cantonese speakers learnt the target tone-segment mappings but English speakers did not, regardless of their musical background. These reveal that English learners failed to form tone categories at the word level, potentially because they perceptually assimilated the pitch patterns in the learning targets to intonation categories in English (rise and fall). Prior musical training did not facilitate the formation of lexical tone categories, providing evidence for the separation between music and speech.

Topics: Cross-language and nonnative perception, Lexical tones, Psycholinguistics

Segmental context effects on the perception of Mandarin tones by French L2 learners

Qing Zhou, Laboratoire de Phonétique et Phonologie, CNRS, UMR-7018, Université Sorbonne Nouvelle - Paris 3

The lexical tones of Mandarin Chinese represent a great difficulty for learners from a non-tonal L1 background like French. This study aimed at examining the effect of segmental context on the perception of Mandarin Chinese tones by French learners of Mandarin (beginning and advanced levels), to be compared with the perception by native Mandarin listeners. Mandarin tone contours show variation due to segmental context (Howie, 1976; Hu, 1987; Yip, 1990), with the possible consequence that some tones can be more easily identified in certain contexts than others. For example, Yang (2012) found that, for American learners of Mandarin, tones in syllables with an alveolar onset and/or a diphthongized rime are the most difficult to identify. No previous work has examined the influence of segmental context on the tonal perception of French learners. Since Mandarin and French differ a lot in terms of consonant and vowel inventories, we might expect tone-segment interferences in French learners' tone perception for segments foreign to French. In this experiment, naturally produced Mandarin monosyllables, varied in terms of onsets and rimes, were used as stimuli for tone identification. 9 onsets of different places of articulation ([p, p^h, t, t^h, k, k^h, ɕ, ʂ, ø]) were combined with 3 types of rimes (monophthong, diphthong and nasal). 28 French learners of Mandarin of two different levels and 14 Mandarin native listeners participated in the study. Unlike native listeners, French learners' tone perception was significantly influenced by tonal features as well as by onset- and rime-types (e.g,. closing diphthongs biased perception towards rising tone). This suggests that L2-tone acquisition studies should take into account not only the L2 tonal system but also the differences between the segmental phonological systems of L1 and L2.

Topics: Cross-language and nonnative perception, Lexical tones, Psycholinguistics, Teaching and assessment

When fairly small meets fairly large: Perception of English consonants by native speakers of Kalaallisut (West Greenlandic)

Ocke-Schwen Bohn, Aarhus University

Kulunnguaq Korneliussen, Aarhus University

Studies of nonnative speech perception have mostly focused on individual contrasts (e.g., /r/-/l/) or specific phonetic dimensions (e.g., voice onset time). The present study reports two experiments which examine the perception of the complete set of English initial consonants by native speakers of Kalaallisut (West Greenlandic). Most accents of English allow 23 consonants in initial position, with voicing contrasts for all plosives and fricatives, whereas Kalaallisut has 13 initial consonants with no voicing contrasts. We generated predictions for the identification of English consonants by native speakers of Kalaallisut from a comparison of the consonant inventories (initial position) of the two languages, and from Experiment 1, in which 12 native speakers of Kalaallisut perceptually assimilated English consonants, presented in [Ca] syllables, to their native inventory, using Kalaallisut labels and providing goodness-of-fit ratings of these matches. The predictions were then tested in Experiment 2, in which the same participants as in Experiment 1 identified the same consonants, using English labels. Neither the comparison of the consonant inventories nor the results of the perceptual assimilation experiment account satisfactorily for the patterns of (mis-) identification observed in Experiment 2. We conclude our study with a discussion of factors which contribute to the observed patterns in addition to descriptive and perceptual comparison of the consonants of Kalaallisut and English, and with a critical evaluation of the usefulness of perceptual assimilation tasks in predicting problems in cross-language speech perception.

Topics: Consonant perception, Cross-language and nonnative perception

Presentation Session: 13C2

Is French more "true voicing" than Japanese? Perception of plosive voicing in French vs. Japanese

Jiayin Gao, JSPS-Sophia University (Tokyo)
Takayuki Arai, Sophia University (Tokyo)

This study examined the perceptual role of pitch and VOT in the voicing contrast of Japanese and French plosives. Both languages are traditionally described as "true voicing," exhibiting robust pre-voicing in the voiced plosive series.

Recent phonetic studies have shown that Tokyo Japanese (TJp) utterance-initial voiced plosives are undergoing devoicing (Takada et al., 2015), while French ones remain robustly pre-voiced (Solé, 2018). Pitch is higher after voiceless than voiced plosives in both languages, but to a larger degree in TJp than French (Gao & Arai, 2018). In other words, modern TJp would be less "true voicing" than French, with a lesser relative weight of VOT compared to pitch in TJp than French.

We asked whether this pattern in production is reflected in perception, and carried out an identification test with TJp vs. French listeners. They were presented with modified natural stimuli derived from two voicing minimal pairs. Two associated continua were constructed, orthogonally varying the word-initial plosive VOT from -60 to +40 ms, and the following vowel pitch from high to low.

For both language groups, VOT perception was categorical. The boundary VOT was smaller for French than TJp listeners. Listeners relied more on pitch for ambiguous VOTs around 0 ms. For extra high pitch stimuli, even for negative VOTs, listeners were biased toward voiceless responses. This bias was stronger for TJp than French listeners.

In summary, Japanese listeners are more sensitive to pitch and less sensitive to pre-voicing than French listeners, which mirrors their production patterns. However, both groups demonstrate higher sensitivity to pitch raising, which cues voicelessness, than to pitch lowering. This is in line with production studies suggesting that the pitch difference after voiceless vs. voiced obstruents is due to voiceless plosives raising pitch rather than voiced plosives lowering pitch (Hanson, 2009; Kirby & Ladd, 2016).

Topics: Consonant perception, Cross-language and nonnative perception

Poster Presentations 30 August (P1-01 – P1-30)

Phonetic drift in fricatives

John Matthews, Chuo University
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Previous research has shown that L2 learners immersed in a target language environment exhibit phonetic drift in L1 category boundaries along VOT (Chang, 2002, 2010; Tice & Woodley, 2012) and vowel formant (Guion, 2003) dimensions, which subsides after an extended duration of immersion. This study investigates the articulation of coronal fricatives in Japanese and in English by three groups of bilinguals — a) late bilinguals who have studied abroad; b) late bilinguals with no experience abroad; c) early (simultaneous) bilinguals — to determine whether they differ from one another in distinguishing post-alveolar sibilants of English, [ʃ], and Japanese, [ɕ], and whether there is evidence among late bilinguals of phonetic drift in the alveolar sibilant [s] common to both languages under pressure from the novel English post-alveolar.

Participants produced real words containing each of the test segments before a low vowel in four blocks, two in English and two in Japanese both in isolation and embedded within a carrier phrase. Productions were recorded and submitted to acoustic analysis. Measurements of spectral Center of Gravity (Hanulikova and Weber, 2010) revealed differences between the two languages only among late bilinguals with no study abroad experience. Without intensive immersion experience, these participants were expected to exhibit no evidence of phonetic drift; however, the pool from which they were recruited was comprised of Japanese university students majoring in linguistics with coursework in English phonetics. We therefore speculate that phonetic drift may not arise solely from intensive exposure in an immersion environment but from heightened perceptual awareness brought about through acquired metalinguistic knowledge as well. It is surmised that any experience of phonetic drift that the other two groups may have had must already have subsided by the time of testing given the extent of their exposure experience.

Topics: Bilingualism and multilingualism, Consonant production

Presentation Session: P1-02

A case study of adult multilingual phonological development in the initial stages of L3 learning

Christina Golin, University of Münster, Germany
Ulrike Gut, University of Münster, Germany
Romana Kopeckova, University of Münster, Germany
Wander Lowie, University of Groningen, Netherlands

Despite the growing research interest in the acquisition of L3 phonology (Cabrelli de Amaro & Wrembel 2016), the focus has mainly been on the outcome of L3 acquisition rather than on the developmental process per se. Adopting a Complex Dynamic Systems Theory approach to multilingual development (de Bot 2012, 2017), the present paper reports on a longitudinal case study into the phonological development of a German learner of L2 English (AOL 8 years) and L3 Polish (AOL 22 years). With the aim to examine the nature and extent of phonological interaction between his non-native languages, 20 weekly sessions were recorded over the first six months of his L3 learning as well as one session before L3 input. The production of /v/, /w/ and vowel reduction in unstressed syllables was investigated as potentially challenging for German learners of English and Polish (Sönning 2017, Hentschel 1986).
A total of 214 /v/, 323 /w/, and 964 unstressed vowel tokens were elicited in L2 free speech and L3 picture naming and delayed repetition tasks, and analysed auditorily by three phonetically trained raters. A ratio of the vowel length in stressed/unstressed syllable pairs was also calculated. The data show that with growing learning experience the multilingual's amount of variation in the realisation of /v/ and /w/ decreased in both his L2 and L3, and developed in alignment. He distinguished between vowel reduction in both languages from the earliest stages of classroom learning, although his L2 performance was more variable than the L3 in this regard. Interestingly, it was in the first weeks of L3 immersion experience that his production of vowel reduction differed most in the two languages (negatively correlated) to later develop in alignment (positively correlated). The multilingual's L2 and L3 thus emerged as supportive growers in the initial stages of L3 phonological acquisition.

Topics: Bilingualism and multilingualism, Consonant production, Modeling, Vowel production

The effects of semantic coherence on proficient Chinese learners' prosodic grouping

Sichang Gao, Shanghai

Previous research has demonstrated that semantically coherent units cast significant influence on speakers' prosody grouping (Cooper and Paccia-Cooper, 1980; Gee and Grosjean, 1983; Ferreira, 1988; Lu, 1998; Jun, 1993; Watson and Gibson, 2004; Waston and Wagner, 2010). A meaning-based hypothesis states that speakers tend to group or chunk the language content that has coherent semantic relations together (Chen, 2000; Wang, 2003; Watson and Gibson, 2004). Since the acquisition and learning of prosody in a second language are challenging even among the high-level language learners' group, this study aimed to detect whether the high-level learners' prosodic grouping performance is influenced by semantically coherent units in the same way as a native speaker. In order to investigate how learners of Chinese incorporated boundaries and breaks to group the language content, we elicited twenty learners' productions of sentences systematically varying in the coherence and length of semantically related collocation. Twenty native speakers' performances were also recorded as the baseline. Both groups' speech production was elicited by a sentence memorization task. Mixed-effects modeling was used to analyze the pattern of prosodic boundaries in these sentences, where boundaries were defined in terms of acoustic measures by following the ToBI (Tones and Break Indices) prosodic annotation scheme. The results show that no matter how proficient the speakers were, they did not show the phonological coherence on the semantic preferred collocations. However, native speakers produced much fewer boundaries inside the semantically coherent units than in the less coherent units. Since our language learners are evaluated as proficient language users with a long-term language learning experience, we conclude that prosodic grouping ability is one of the language skills that is difficult to acquire even the learners are in the target language environment. Future research could investigate whether the ability is learnable through explicit classroom training.

Topics: Bilingualism and multilingualism, Intonation

Mandarin L2 learners of Australian English can produce phonemic vowel length contrasts

Ivan Yuen, Macquarie University
Hui Chen, Université Paris Descartes
Nan Xu Rattanasone, Macquarie University
Katherine Demuth, Macquarie University

Models such as Perceptual Assimilation Model (Best et al., 2001) and Speech Learning Model (Flege, 1995) often assume that detectable differences will facilitate the process of forming phonological categories in a second language (L2) in perception, leading to target-like production. Non-rhotic Australian English (AusE) distinguishes the /ɐː/-/ɐ/ contrast (e.g., heart vs hut) with a durational ratio of 2:1 and minimal spectral difference (Chen et al., 2017). Mandarin does not have contrastive vowel length (Lee & Zee, 2003). Although non-contrastive phonological features are challenging to learn, detectable perceptual differences might moderate such challenges. The present study therefore investigated whether Mandarin learners of AusE can produce these vowel length contrasts, using the target 2:1 vowel duration ratio. We predicted that they might hear the phonetic differences in vowel length in the input and realise such distinction, but not with a native-like durational ratio.

Twenty-five monolingual AusE speakers (8M, 17F; M = 21;10) and 27 Mandarin speakers (10M, 17F; M = 28;1) took part in an elicited production task. Four CVC minimal word-pairs (carp-cup; cart-cut; dark-duck; heart-hut) were auditorily presented in isolation. Participants used the stimuli to form a sentence (e.g. 'I heard the X').

Results from the linear-mixed effects model showed significant effects of vowel type $(F(1)=28.927, p<.001*)$, group $(F(1)=39.039, p<.001*)$ and their interaction $(F(1)=44.6, p<.001*)$. Both groups showed a durational difference between /ɐː/ and /ɐ/. Although /ɐː/ duration did not differ between groups, /ɐ/ was significantly longer for Mandarin than AusE speakers. The average vowel durational ratio was 1.9:1 for AusE speakers vs. 1.4:1 for Mandarin speakers.

In short, Mandarin speakers have not yet attained a native-like phonetic realization of the short vowel, although they can differentiate these phonological categories. This raises questions about when vowel length contrasts are established in perception and when their productions become native-like.

Topics: Bilingualism and multilingualism, Vowel production

L2 experience with other bilingual speakers can lead to a more pronounced difference in the production of similar phones across languages

Wai Ling Law, The Chinese University of Hong Kong, Shenzhen
Alexander Francis, Purdue University

Increased second language (L2) experience can help bilinguals better discern phonetic differences between similar L1 (first language) and L2 segments and improves production and perception (Aoyama & Flege, 2011). While the effects of L2 experience are well-studied in speakers dominant in their L1, little is known about the effects of L2 experience when it occurs between bilinguals in a diglossic setting. This study investigated the influence of amount of L2 use and L2 proficiency in Cantonese-English bilinguals' production of /u/ which is produced more front in English than in Cantonese (Bauer & Benedict, 1997) and in their f0 means that are higher in English than in Cantonese (Ng et al., 2012). Twenty native Cantonese-English bilinguals (14 women, 6 men) living in Hong Kong participated. They spent on average less than 10% of each week interacting with L1 English speakers, but 0.77% to 35.38% (mean = 15%) of time weekly interacting with other bilinguals. Participants produced near homophones (words in the two languages sharing comparable phonemes) in carrier sentences in both languages under conditions emphasizing each language on different days. All six Cantonese lexical tones were represented. The F2, acoustic measure of frontness, of /u/ (measured at 50% into the vowel) and f0 means (taken during the vowel) were measured and normalized for gender difference and subsequently compared to participants' L2 use and proficiency elicited in a detailed questionnaire. Results indicate that as speakers' L2 use and proficiency increase, the F2 of English /u/ increases (more fronted) while that of Cantonese /u/ remains stable. Increased L2 use and proficiency also led to a higher f0 mean in English and a lower one in Cantonese. Taken together, these results suggest L2 experience with other bilinguals may also lead to more pronounced differences in the production of similar phones.

Topics: Bilingualism and multilingualism, Vowel production

Listening to songs and singing benefit initial stages of L2 pronunciation

Florence Baills, Universitat Pompeu Fabra
Yuran Bu, Universitat Pompeu Fabra
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Pilar Prieto, Universitat Pompeu Fabra

While growing evidence points to the beneficial effects of musical expertise and aptitude on L2 phonological processing (e.g., Burnham, Brooker, & Reid, 2014; Christiner & Reiterer, 2013; Milovanov, Pietilä, Tervaniemi, & Esquef, 2010), and listening to and singing songs may help L2 vocabulary learning (e.g., Yousefi, Yekta, & Farahmandian, 2014; Rukholm, 2011; Ludke, Ferreira, & Overy, 2014), there is limited evidence about the benefits of song-based training for second language pronunciation, and specifically the potential differences between listening to songs and singing.

The present study wanted to explore the effect of (a) listening to song vs. rhythmic speech (Exp1); and (b) singing vs. listening to song (Exp2) on L2 pronunciation and vocabulary learning. Following a between-subject pre- and posttest design, 118 Mandarin Chinese students (Mage = 17.5) without knowledge of French learned the lyrics of a meaningful French song with basic vocabulary. Melody and rhythm in the listening to song and singing conditions were uncomplicated, repetitive and cheerful. Participants were exposed to the song three times for a duration of 4 minutes. Just before and after training, they were asked to repeat 12 target words from the song. Participants' accentedness was assessed perceptively by two French native speakers on a scale from 1 to 7. In addition, at posttest, they undertook two vocabulary tasks.

Results revealed that (a) participants in the listening to song group reduced their accentedness significantly more than those in the rhythmic speech group (κ =.715, F(1,99 = 6.450, p = .011); and (b) participants in the singing group outperformed significantly those in the listening to song group (κ =.669, F(1,115 = 7.457, p = .006). However, no beneficial effects of either of the experimental conditions was found regarding vocabulary learning. All in all, these results have important implications for pronunciation instruction at least at beginner-level.

Topics: Consonant perception, Consonant production, Intelligibility and comprehensibility, Stress and accent, Training, Vowel perception, Vowel production

Analyzing French /ʁ/ Perception in Chinese Learners Using Quantitative and Qualitative Approaches

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Language learners are known to perceive non-native phonemes based on similar phonemes in their native language. Accordingly, Chinese learners of French tend to have difficulty distinguishing French /ʁ/ from Chinese /x/ ("h" in Pinyin). This study aims to analyze /ʁ/ perception in Chinese learners of French using both quantitative and qualitative approaches.

Five French and five Chinese native speakers participated in this study. All five Chinese participants, between the ages of 22 and 27, have grown up in northern China and were studying in Paris. The stimuli, produced by both a French native speaker and a Chinese native speaker, consisted of syllables with /ʁ/, /x/, /l/ or /w/ in onset position followed by /a/, /o/, /ə/, /i/, /u/ or /y/. Participants were asked to identify the consonant they heard in each syllable. In addition to token analyses, generalized linear mixed models (GLMM) were carried out using R. In contrast to previous studies, each identification test (quantitative approach) concerning the Chinese participants was followed by an interview (qualitative approach) during which participants were asked semi-open questions related to the identification test. Results from the quantitative analyses show that, unlike French participants, Chinese participants tend to have difficulty distinguishing /ʁ/ from /x/. GLMM and post-hoc tests suggest a better identification rate for /ʁ/ followed by /i/ or /y/ than /ʁ/ followed by /a/ (reference: /a/; /i/: $p<0.01$; /y/: $p<0.01$) or /u/ (reference: /u/; /i/: $p<0.05$; /y/: $p<0.05$). Qualitative results suggest that, besides phonological processing, participants may rely on lexical processing. Despite being instructed to identify consonants in syllables, three of the five Chinese participants acknowledged that they could not help trying to map the isolated syllables onto existing lexical items from Chinese, French or (even) English. Results from both approaches suggest that the qualitative data could give important insights on quantitative results.

Consonant perception, Cross-language and nonnative perception

The effect of stimulus length on the L2 perception of Korean stops

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Previous studies have found that the Korean word-initial lenis-aspirated stop contrast, which is cued primarily by the f0 of the following vowel, is difficult for L2 learners to discriminate, regardless of whether the learner's L1 is tonal (Oh, 2013; Yang, 2017; inter alia). Many of these studies used isolated CVs or VCVs as stimuli: although they allow the listener to focus their attention on the target contrast (cf. Davidson, 2011), they deprive the listener of acoustic cues in surrounding segments that might help contextualize the target segment. Thus, the effect of stimulus length is of empirical interest in interpreting findings related to the perception of this contrast. The current study, which was pre-registered, investigated whether additional segmental information in stimuli was beneficial or detrimental to the L2 identification and discrimination of Korean stop contrasts. Method: L1 Mandarin L2 learners of Korean (n=32) and L1 Korean (n=32) listeners completed identification and discrimination tests of Korean stop contrasts in 4 environments: /Ca/, /Cata/, /aCa/, /taCa/. It was hypothesized that listeners would be more accurate on /Cata/ than /Ca/ due to the benefit of f0 information provided in the second syllable, but less accurate on /taCa/ than /aCa/, as the additional stop at the beginning of the first syllable would serve only to distract the listener. Results: Planned paired t-tests showed that both L1 and L2 listeners were significantly more accurate at identifying and discriminating Korean stops in /Cata/ than in /Ca/ stimuli, but equally or significantly less accurate in /taCa/ than in /aCa/ stimuli. Although many L2 perception studies use a single type of stimulus, these results demonstrate the importance of considering the effect of surrounding segments and stimulus length on L2 perception, and that these effects on the perception of a single phonological contrast can vary across syllabic environments.

Topics: Consonant perception, Cross-language and nonnative perception

An experimental study of L2 English nasals produced by Chinese and Pakistani English speakers

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English as a lingua franca (ELF) is of great importance for cross-linguistic communication between local and international students in Chinese universities. This paper reports an experimental study of L2 English nasals produced by both Chinese English (CE) and Pakistani English (PE) speakers so as to find out to what extent the acoustic features of their English nasals are similar to and different from those of native English speakers, and in which aspects their nasal pronunciation may hinder their mutual intelligibility in L2 English. The subjects of the present study include 2 RP speakers from Britain (1 male, 1 female), 17 CE speakers (12 male, 5 female) and 17 PE speakers (12 male, 5 female). The target 3 English nasals were embedded in the carrier sentences read by the subjects. The data were recollected in the laboratory of phonetics at University of Cambridge, UK and Yangzhou University Laboratory of Phonetic, Hearing, and Cognitive Science, China respectively, and then analyzed acoustically (i.e., duration, F1, F2) via Praat 6019_64 and statistically via SPSS 21.0. Results shows that: 1) In terms of duration, both CE and PE share the same pattern as BE: word-initial nasals are much longer than word-medial and -final, but there are significant differences only between CE and BE in word-initial /m/(Sig.=.044), word-final /n/(Sig.=.000) and word-medial /ŋ/(Sig.=.000), and between PE and BE in word-medial/m/(Sig.=.000), word-initial /n/ (Sig.=.011) and word-medial and -final /ŋ/ (Sig.=.009/.017). 2) In terms of tongue positions, there're huge significant differences between CE/PE and BE in F1 and F2 of target nasals in different contexts, though CE and PE don't differ much, demonstrating that it is the quality and quantity of oral blockage that distinguish L2 CE and PE nasals from native BE. 3) Moreover, both CE and PE speakers tends to insert /g/ after/ŋ/as an indicator of overgeneralization.

Topics: Consonant production

Voice Spreading in Japanese Loanwords

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It is generally believed that, in Japanese, the Foreign strata is considered more peripheral than the Yamato (Ito and Mester 1995). Contradicting to such an observation, however, some loanwords are affected by the phonological constraint that has been thought only to govern the native vocabulary. For example, Lyman's Law governs geminate devoicing in loanwords, and renders the optionality of doggu/dokku 'dog' (Nishimura 2006). In addition, there is another phonological phenomenon on the optionality of voicing in loanwords. One well-known example is redundant voicing of words such as 'avocado'; many Japanese native speakers pronounce it [abogado], adding extra voicing not present in the original loanword. It is puzzling why some loanwords seem to violate the widely recognized OCP(voice) and choose more marked forms than their original with some respect. This study reports the results of a statistical survey on this redundant voicing and offers a theoretical account within the framework of Underspecification Theory. We collected 36 examples of redundant voicing and examined some possible influencers, such as vowels, post-nasal voicing, and the existence of another voiced obstruent. Each of the potential triggers was tested by the chi-square test of independence, comparing with 100 loanwords randomly chosen from a dictionary. Our research revealed that redundant voicing mainly occurs when there is a voiced obstruent in the immediately preceding syllable, but vowels and nasals have nothing to do with redundant voicing. These facts are explained in the framework of Underspecification. We argue that an additional [voice] feature is made available from the preceding distinctive [voice] through the feature spreading. This analysis suggests that redundant voicing in loanwords is strongly restricted by the OCP(voice) and restricted by Lyman's Law since the process is just the sharing of the [voice] feature, not adding thereof.

Topics: Consonant production

Long-term language immersion and the acquisition of non-native palatalized contrasts

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This study investigated the effect of Russian language immersion on Japanese learners' production of the Russian palatalized contrasts /C^{j}V/, /C^{j}jV/, and /C^{j}ijV/. Although both the Japanese and Russian languages have palatalized sequences, Japanese lacks the /C^{j}jV/ sequence. Therefore, Japanese speakers lacking Russian language experience tend to produce /C^{j}jV/ with vowel epenthesis to fit Japanese phonotactics, which contrasts with /C^{j}V/ but not with /C^{j}ijV/.

While some studies have suggested that language immersion experiences can improve the pronunciation of L2 vowels by adult learners (e.g., Flege, 1997), other studies have not, even after a year of language immersion (Oh et al. 2011).

The participants were eight Japanese learners of Russian who had 9–14 months of Russian language immersion, 13 Japanese learners of Russian with no long-term language immersion experiences, and nine native Russian speakers. They produced /b^{j}V/, /b^{j}jV/, and /b^{j}ijV/ nonce words with /V/ stressed (e.g., /ˈb^{j}ada/) because bilabial consonants do not include specific tongue movement (Ladefoged & Maddieson, 1996) and are suitable for observing the behavior of the palatal glide. To normalize speech rate differences, we measured the relative duration—durations of the palatalized part after the initial burst release divided by the duration of a different syllable after the initial burst release as well. Statistical analyses of the relative duration by LME found that the durational contrasts for /C^{j}jV/ and /C^{j}ijV/ were significantly larger in the native speakers than in both Japanese learner groups and that the durational contrasts for /C^{j}V/ and /C^{j}jV/ were significant in all three groups. These results implied that both Japanese learner groups were able to differentiate /C^{j}V/ from /C^{j}jV/, presumably due to vowel epenthesis, but were unable to distinguish /C^{j}jV/ from /C^{j}ijV/. Therefore, to conclude, long-term language immersion did not enable Japanese learners of Russian to acquire durational contrasts for /C^{j}jV/ and /C^{j}ijV/.

Topics: Consonant production

L2 rhythm effects on intelligibility: An investigation of Spanish and Portuguese speaking learners of German

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While several studies agree that prosodic errors can significantly affect the intelligibility of non-native speech (Anderson-Hsieh et al. 1992, Trofimovich & Baker 2006), it remains unclear to which extend this applies for speech rhythm.

To find out which features of rhythm correlate with intelligibility, the present study compares L2-speech of German learners with L1 Spanish and European Portuguese (EP). Both languages display remarkable differences in rhythm, which are reflected by different phonological processes (Reich & Rohrmeier 2014). Thus, rhythmic differences are expected for L2-speech as well.

A pilot study was carried out, recording 4 learners with L1 Spanish and L1 EP reading 12 true/false statements in German. All items were analyzed in Praat (Boersma & Weenink 2017) for rhythm-related features (word/phrase accent placement, reduction syllables, vowel and consonant elisions/epenthesis), rhythm metrics (Dellwo 2006, Grabe & Low 2002, Ramus et al. 1999) and non-linguistic factors like speech rate and pauses which also affect rhythm (Prieto et al. 2012). Intelligibility indices (reaction time, dictation correctness, rating on Likert-scale) of the recorded L2-utterances were identified through a multimodal perception task experiment with 12 L1 German listeners, including a sentence verification task (Munro & Derwing 1995).

First results show that strongest correlations can be found between rating scores and syllable-based processes (inappropriate vowel and consonant elision/epenthesis). A qualitative analysis of misunderstood items confirmed these findings and revealed the negative effect of wrong word accent placement on intelligibility. However, rhythm metrics only give a blurry idea about how the rhythmic shape of L2 affects intelligibility, as syllabication processes and accent placement play a crucial role for word (and word boundary) identification, but they occur 'underneath' the phonetic surface. Therefore, the ongoing large-scale study discards rhythm metrics as a measure for rhythmic shaping and focusses solely on phonological processes like accent placement and syllabication processes.

Topics: Consonant production, Cross-language and nonnative perception, Intelligibility and comprehensibility, Rhythm, Stress and accent, Vowel production

Vowel nasalisation and nasal context: French compared to Chinese

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We compared French and Mandarin Chinese on how segmentally similar CVC syllables with one or two nasal consonants (e.g., /tan/ or /man/) are produced. French, but not Mandarin, has a phonemic nasal contrast for vowels. We looked at the possible phonetic consequences of this phonological difference.

In a classic study, A. Cohn (1990, 1993) compared phonetic and phonological rules of nasalisation, using three different languages —French, Sundanese, and English— to illustrate a phonologically driven model of phonetic target interpolation. In essence, segments unspecified for the [nasal] feature undergo phonetic interpolation of nasality when surrounded by a [+nasal] and a [−nasal] segments (e.g., /i/ in English dean or need). Such phonetic interpolation does not occur in French, which has no segment unspecified for [nasal]. If vowels are unspecified for [nasal] in Mandarin, just like in English, they should be nasalised differently from French and similarly to English.

To test this prediction, we compared segmentally similar French and Mandarin syllables with a nasal context (/tan, lin, man, min/). We also examined nasal-velar coda Mandarin syllables (e.g., /taŋ/) and "control" syllables with no nasal coda. Mandarin syllables carried high-level tone 1. We collected separately the nasal and oral output signals of a piezoelectric accelerometer on the nasal ridge and a microphone by the cheeks, respectively. We computed rms intensities for both signals, and the nasal/oral ratio of rms intensities as indexing nasality.

Contrary to expectations, we found no more vowel nasalisation in Mandarin than French, for either onset or coda nasal-consonant context. Rather, we found that French and Mandarin clearly differ with respect to the phonetic set-up of their nasal consonants. In particular, there is much less discontinuity between vowel nucleus and nasal coda in Mandarin than French. Our findings thus are questioning the segmental status of nasal codas in Mandarin.

Topics: Consonant production, Vowel production

Presentation Session: P1-15

Voicing effects on durational characteristics of English words by Japanese learners: A preliminary
analysis

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It is well attested that vowels are longer before voiced than voiceless consonants in English. House (1961) claimed that vowel duration in productions by American English speakers (AE) is affected especially by the voicing of postvocalic consonants and the target vowel quality. Yoneyama and Kitahara (2014) found similar voicing effects in Japanese produced by infants and adults, and also in English produced by Japanese learners (JE), although the effects were substantially smaller than those reported for English.

However, previous studies on voicing effects in JE overlooked an important factor: gemination in loanwords, which involves wide-ranging theoretical issues in Japanese phonology. First, many words borrowed from English are realized with a geminate in Japanese, e.g. "kid" → kiddo, "rush" → rasshu, under intricate conditions of tenseness and stress in the source language. Second, gemination of voiced obstruents is generally dispreferred, sometimes exhibiting devoicing, e.g. "bag" → baggu → bakku, but not consistently, e.g. "mad" → maddo. It is suspected that these tendencies in the Japanese loanword lexicon may interfere with the production of voicing effects by JE speakers.

Data from a production experiment using monosyllabic English words with and without gemination in their borrowed counterparts were analyzed. Participants were twenty-two university students in Tokyo from intermediate to advanced proficiency levels in English, and three AE speakers for control. Preliminary results suggest that vowel duration before voiced consonants was unaffected by the geminatability, which was determined by 12 Japanese listeners who judged gemination in an independent perception study. However, vowel duration before voiceless consonants was shorter when the borrowed form was geminatable. Closure duration showed an inverse trend with respect to voicing and geminatability, but none of these tendencies were evident in the AE data. Thus, voicing effects attested in AE speech is not straightforwardly realized in JE because of L1 phonology.

Topics: Consonant production, Vowel production

L2 Perception and Production of English Word Stress with Different Suffix Categories by L1 Thai Learners

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The aim of this study is to investigate L1 Thai learners' English word stress perception and production of two categories of English suffixes: suffixes affecting stress placement e.g. ('nátional' vs. 'nationálity') and neutral suffixes e.g. ('téach' vs. 'téacher'). Two groups of Thai first-year undergraduate learners participated in this study: 30 L1 Thai beginners and 30 L1 Thai intermediate learners. They completed two tasks: "Marking English Word Stress in Sentences" and "Reading English Word Stress in Sentences". The data were analyzed by two English university lecturers teaching in a Thai university. The results showed the L1 Thai intermediate learners significantly outperformed the L1 Thai beginners in both perception and production. It could be assumed that the L1 Thai intermediate learners knew stress assignment rules of English words containing suffixes than the L1 Thai beginners. However, no significant difference in English word stress perception of English words with neutral suffixes was evidenced. It is assumed that they are less complicated than the other suffix category, resulting in the L2 learners being able to perceive and produce English word stress more easily. It was assumed that the problems of English stress assignment were caused by both interlingual and intralingual factors (Ellis, 2003; Haryani, 2016). Word stress placement rules in English and Thai differ substantially. Thai learners of English tended to add tones to English words when speaking which caused them to incorrectly give a stress on a wrong syllable. Moreover, according to the Interlanguage Hypothesis, strategies of second language learning possibly have a negative impact on the problems (Selinker, 1972; Corder, 1999). The results contribute to second language acquisition with respect to English word stress by L2 learners. The research findings provide pedagogical implications for teaching and learning English pronunciation.

Topics: Cross-language and nonnative perception, Intelligibility and comprehensibility, Stress and accent

Presentation Session: P1-17

English vowel production by Japanese speakers: Effects of learning and L1 carry-over

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Evidence indicates that L2 segmental production is linked to speakers' perceptual representations, as reflected in prevailing theoretical models. Nonetheless, accurate perception is not a guarantee of accurate production, and large between-learner differences in both have been observed. Discrepancies between the two skills may be partially due to carry-over into L2 of heavily-practiced production routines from L1 that are deployed to produce segments in L2 with minimal or no adjustment. On the one hand, good L2 production might signal success in developing new, accurate production patterns. Poor production, on the other hand, might result from continued use of old routines. If so, then inaccurately produced L2 segments should be "well behaved" in that hey should closely resemble segments in the L1 repertoire.

Talkers were 17 native speakers of Japanese who were relatively homogeneous with respect to age (young adults) and English learning experience in Japan. All had come to North America in early adulthood, and all were proficient enough to enroll in English-speaking post-secondary institutions. By design, their length of North American residence ranged from 6 months to 5 years. From each talker, English productions of 31 words containing /i/, /ɪ/, /u/, and /ʊ/ in variable contexts were elicited via a picture naming task. These were compared with their productions of 33 words containing the nominal high and mid Japanese vowel categories, both long and short. Data were analyzed both acoustically (duration, F1, F2) and impressionistically (ratings of English vowel "goodness"). The complex patterns seen in the results gave some limited support to the carry-over prediction. On the one hand, the talkers showed clear evidence of having acquired some new production routines that were clearly distinct from those of L1. On the other, durational and spectral properties of some English lax vowel targets suggested use of largely unmodified L1 production strategies.

Topics: Intelligibility and comprehensibility, Vowel production

Examining the role of learning experience, motivation, and aptitude on second language segmental acquisition

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Second language acquisition (SLA) researchers have extensively investigated how second language (L2) learners develop their L2 pronunciation according to individual varieties such as motivation, aptitude, and L2 learning experience in naturalistic settings (e.g., Moyer, 1999), where learners are exposed to a target language on a daily basis. Recently, a growing interest has been paid to the generalizability of those findings from naturalistic SLA to foreign language (FL) learning contexts in which learners' access to the L2 is restricted both qualitatively and quantitatively (e.g., Saito et al., 2018).

Focusing on English unstressed vowels that has been found difficult to acquire for L2 learners whose L1 has different prosodic features, the current cross-sectional study examines whether and to what extent motivation, aptitude and learning experience are related to the variety of their segmental productions. The study participants comprised of 50 Japanese learners of English in a FL learning context. The participants' English unstressed vowels were elicited via a sentence-reading task and then analyzed by four acoustic features; duration ratio, intensity ratio, F0 ratio and vowel quality (Lee et al., 2006). Meanwhile, learning experience and motivation were measured by questionnaire that has been developed to tailor to the Japanese EFL context, and aptitude was measured through the LLAMA test (Meara, 2005).

The statistical analyses showed two significant correlations between the acoustic features and the factors: a) the duration ratio (how shorter learners can produce unstressed vowel relative to stressed vowel) and the motivation factor (work-related and integrative motivation), b) the intensity ratio (how weakly learners can produce unstressed vowels) and the experience factor. In contrast, aptitude was not related to any acoustic features. This interplay between learners' segmental acquisition and the individual factors will be discussed from pedagogical and psycholinguistic perspectives.

Topics: Attitude and identity, Psycholinguistics, Vowel production

Do learners with accurate word prosody also produce accurate sentence prosody? Lexical accent and downstep in L1 Italian learners of L2 Japanese

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Japanese intonation is largely determined based on the distribution of lexical pitch accents, which generally remain intact when embedded in larger sentences. Accordingly, most previous research on the L2 acquisition of Japanese accent has focused on words in isolation. The assumption appears to be that word-level findings would 'scale up' to sentence contexts, but thus far, this assumption has gone largely untested. Moreover, the focus on words in isolation has resulted in relatively little research on how learners' acquisition of lexical accent specifications is related to the acquisition of global, post-lexical aspects of Japanese intonation like downstep.

The present study explores these issues using data from an ongoing project to create a corpus of upper elementary L2 Japanese learner speech experimentally elicited via six different tasks, each targeting a different challenging aspect of Japanese prosody (e.g. downstep). While the corpus as a whole represents a diverse sample of L1 groups (including Russian, Korean, and Chinese learners), the analyses reported here specifically compare the L1-Italian learners (N=15) to baseline native speakers (N=4). From the downstep task, 6 sentences with at 2-3 accents were selected and learners' productions of the sentence as a whole were compared to their productions of the various individual constituent words (e.g., takái nikú-o tabéru "eat expensive meat" as well as takái, nikú, and tabéru separately).

Regarding the sentence vs isolation distinction, the results suggest a broad range of interlanguage trajectories, with some learners showing difficulties in maintaining lexical accent in sentences (often due to sentence-level deaccentuation, especially for the adjectives) and others showing the opposite pattern (accurate in sentences but not words). Moreover, even tokens with all lexical accents produced correctly were often lacking target-like downstep. Thus, a learner's success at acquiring lexical specifications does not guarantee target-like production of the same words in a sentence context.

Topics: Intonation, Lexical tones, Stress and accent

A Japanese Accent Database for L2 Learners

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Pitch accent is a complex phenomenon in Japanese phonology. A wide variety of dialects with varying patterns are manifest across native speakers; even normative pitch systems are enforced with associated dictionaries in careers like news broadcasting. Accenting for L2 learners of Japanese is even more difficult. The differences are subtle and challenging for learners to notice or acquire. Often learners are discouraged altogether from learning pitch, yet incorrect pitch is a major component of "foreign accent". Few tools exist to help learners develop correct accentuation through study, aside from hard-copy published accent dictionaries developed for native speakers (秋永, 2016). We introduce a new electronic accent dictionary for learners. A user can look up a word and identify accentuation statistics based on empirical data collected from native speakers, compiled in the Corpus of Spontaneous Japanese (CSJ). A subset of the corpus contains over over 200 speech annotation TextGrid files comprising over 40 hours' worth of speech. These files include accent patterns for each utterance along with the speaker's age, sex, and birthplace. The following illustrate abridged examples of varying accents for words found in the CSJ:

大事（daiji）
[%L, H-], Kyoto, age 50, male
[H-], Tokyo, age 50, male
[%L], Kanagawa', age 30, female
異なり（kotonari）
[%L], Kanagawa, age 30, female
[%L, H-], Tokyo, age 30, male
[%L, H-, L%], Chiba, age 40, female
大量（tairyou）
[%L], Niigata, age 60, male
[%L, H-], Kanagawa, age 30, female
[%L', H-, L%], Tokyo, age 30, male

Learners will benefit from this type of information because it provides a resource to better understand the complexities of pitch variation in spoken Japanese and improve pronunciation. Though useful for simple lookup-and-study application, the dictionary also has potential for further use in machine learning applications.

Reference

秋永一枝（Akinaga, Kazue）, 2016. 新明解日本語アクセント辞典. 東京都千代田区：三省堂.

Topics: Lexical tones, Stress and accent

Do Japanese learners use sufficient acoustic cues to manifest acceptable English stress?

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Lexical stress is distinctive in English, so learning how to manifest stress is necessary to achieve fluent communication in English. Stress in English is characterized by higher intensity, increases in pitch height and vowel duration, and changes in vowel quality - so it is difficult to produce for speakers of non-stress accent languages such as Japanese. For example, earlier studies (Kondo 2007, Konishi & Kondo, 2015) showed that Japanese speakers use F0, duration and intensity to mark lexical stress in English, but tend not to alter vowel quality. This study investigated if Japanese speakers' English stress realizations are correctly perceived by native English speakers.

We used a speech database of 62 Japanese native speakers of varied English level pronouncing 19 English words of 2-, 3-, and 4-syllables with varying stress position, which were embedded in carrier sentences. Four trained native English speakers judged stress criteria in two experiments. First, they judged whether the lexical stress positions were on the correct syllable (word stress judgement). Then, they judged whether the correct syllable was stressed (syllable stress judgement).

Since lexical stress evaluation can be highly variable both for a single evaluator and between evaluators, we assessed intra- and inter-evaluator variations. The evaluators mostly judged the Japanese-accented stress control in English (with mainly F0, duration and intensity manipulation) as "stressed" (intra: 90.1-96.2%; inter: 88.3-91.7%), but there was less agreement regarding word level stress judgement (intra: 82.0-94.0%; inter: 78.3-86.6%). The lower recognition of word stress is probably due to the fact that even though the Japanese learners could manipulate some acoustic features to indicate syllable stress, they did not change vowel quality which is a crucial acoustic cue for stress that normally makes the presence or absence of word stress more easily recognizable.

Topics: Rhythm, Stress and accent

Presentation Session:　P1-22

Production of English syllables and word stresses by native Japanese speakers

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Production of prosodic properties of a second language (L2) is difficult for non-native speakers. This study investigated how native Japanese speakers produce English syllables and word stresses. A series of studies investigated the production of English syllable structure by examining the occurrence of epenthetic vowels. In this study, we examined the syllable production by using the segmented syllable production task that separate English words by syllables and produce them.

Fourteen native speakers of Japanese participated in the study. Two kinds of tasks—the segmented syllable production task and the stress placement task—were given. In the segmented syllable production task, participants were instructed to listen to the words and divide them into some parts by inserting pauses. For example, after listening to the word "problem," they produced /prob – (pause) – em/. In the stress placement task, participants were instructed to listen to the words and repeat them with correct stress placement. English words used in this study were 1–6 syllables in length. Ninety-six words by one talker were presented once each in a random order.

The results showed that the performance of both tasks declined as the number of syllables increased. The accuracy of the segmented syllable production task was lower than that of the stress placement task, indicating that it is more difficult for native Japanese speakers to produce syllables than to place stresses. In addition, a high correlation was found between the accuracy of the segmented syllable production task and that of the stress placement task, suggesting that participants who can correctly produce syllables can correctly place stresses.

Topics: Rhythm, Stress and accent

L2 Japanese prosody of contrastive focus and information focus

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This preliminary study investigates how contrastive focus (CF) and information focus (IF) are prosodified in L2 Japanese. Japanese focus words are marked with pitch, with prominence on focus and compression afterwards, regardless of focus type (Pierrehumbert & Beckman 1988, Sugahara 2003). In contrast, English CF is more prominent than IF with pitch and duration (Katz & Selkirk 2005/6). If L1 transfer occurs, it is expected that CF is prosodically more prominent than IF in their L2 Japanese.

A read aloud task was implemented with 10 adult native speakers of Japanese (NSs) and 11 English-speaking JFL learners (JFLs) with JLPT N2 level. They were given three test tokens each for CF and IF in written form and asked to read the second line/answer at natural speed, following the experimenter's statement/question. Their utterances were recorded and analyzed in pitch (normalized in semitone) and duration (ms).

ANOVAs show no significant differences between the groups and the focus types, and no interactions. However, a token effect was identified: In a pair of tokens, a negation iie 'no' weakening the following stressed words is followed by a topic marked with wa, which is subject to resetting a prosodic unit (Nakanishi 2007). Pairwise comparisons in pitch show that the JFLs were significantly smaller in CF post-focus compression than the NSs ($F(1, 38) = 4.889$, $p = .03$). The JFLs' IF duration was also significantly longer than that of the NSs ($F(1, 38) = 10.024$, $p < .01$). Although it is not conclusive with a limited number of test tokens, the results suggest that the JFLs differentiated IF from CF with a greater post-focus compression and longer duration, opposite of what was expected. This might have partially arisen from the phrase stress rules which are "unmarked" with discourse-newness (Selkirk 2008).

Topics: Stress and accent

Production of Prepositions in Different Information Structures of Chinese English Learners

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This study compares the phonetic cues of preposition production between Chinese English learners (CEL) and American speakers (AS). Six prepositions "at, for, from, in, of and to" with high frequencies in COCA corpus were selected as target words, and then put into 3 common verb phrases (VP). The target sentences had a consistent structure of Subject+VP+Object+AP, and each was recorded into 6 information structures.

12 Beijing English major students and 4 American students were recruited as informants. The recording was carried in a sound proof room (with sampling rate of 44 KHz and precision of 16 bits). Target utterances were automatically segmented and manually checked with Praat. The vowel formant, duration, F0 of prepositions were extracted and normalized. ANOVA Analysis and T-test were applied within and across two speaker groups from which we concluded:

1. Vowel quality. For prepositions containing lax vowels, such as "in" and "to", learners show significant difference to Americans (T-test: F1,F2 on all focus $p<0.05$)because Mandarin doesn't have tense-lax contrastive vowel.

2. Duration, learners can't shorten the duration though they achieved vowel reduction. For "from" and "of", there's significant difference on duration, but not on vowel formant. (From: V,O,AP $p<0.001$; Of: broad,S $p<0.05$) The ratio of duration between weak forms and stressed forms shows degree of compression for AS is 50.6%, greater than 52.3% of CES.

3. Pitch, focus on S: learners have low degree of compression. Focus on VP and P: learners adopt falling tone influenced by Chinese fourth tone with larger range (VP: "from,in,of,to" $p<0.05$; P : all $p<0.01$). Focus on AP: learners have pre-nuclear accent on verb phrases, which increases the range of prepositions (AP: "at,for,from,in,to" $p<0.05$).

The results indicate that CES produce prepositions not so weakly as AS. Teaching strategies should be practiced in different focus structures and compare tense-lax vowels together.

Topics: Stress and accent

Presentation Session: P1-25

Prosodic prominence in French causal sentences production by L1 and L2 speakers

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Prosody signals information structure and emotions in speech, but whether it plays a role in expressing logic relations is unclear (Zhang et al., 2018). This study explored the realization of prosodic prominence when L1 and proficient L2 speakers produce French causality sentences, particularly investigating the influence of the event attribute, i.e., the valence of the cognitive appraisal, and the narrative order of the cause and the consequence.

Twelve native French speakers and six Chinese speakers who had passed the French qualification test TFS VIII were recruited to read aloud 66 critical sentences, each of which consists of the CAUSE part where a cause-marked prepositional expression precedes a noun phrase introducing the cause (e.g., "Grâce à + cette décision"), and the EFFECT part where a clause introduces the consequence (e.g., "l'entreprise a vendu ces machines."). The order could be either CAUSE-EFFECT (CE) or EFFECT-CAUSE (EC). Importantly, the prepositional expression which means "because of" hints the appraising valence: while "à cause de" and "grâce à" unambiguously collocate with negatively- and positively-evaluated consequences, respectively, "en raison de" applies mainly in neutral context. With a 2*3 design, six types of critical sentences were created. Here we focused on which part was prosodically more salient. The native French speakers accented the first part in 74% of trials, showing a strong position effect, which is even larger for EC than for CE (79% vs. 69%, p<.001). In contrary, the L2 speakers showed neither position effect nor logic effect; each part was assigned to be salient at chance level. However, both groups showed that the sentence-initial effect clause had lower possibility to be accented when being positive than being neutral (ps<.05). We suggest that prosodic prominence assignment is not driven by causality roles assignment and that L2 speakers may need extra efforts on complex intonational prosody.

Topics: Attitude and identity, Cross-language and nonnative perception, Intonation, Psycholinguistics, Stress and accent

L2 Phonetic Training on Production in Adverse Listening Conditions

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Second language instruction in the classroom setting is accompanied by inherent limitations, among which are inauthentic listening conditions. In L2 use, learners will face acoustic conditions in which their interlocutor's speech signal is degraded by a number of adverse conditions (Mattys et al., 2012). The emulation of realistic listening conditions during phonetic training has been shown to have a positive impact on learners' perceptual acquisition of certain contrasts (Cooke & Lecumberri, 2018). This study examines such phonetic training's effect on production.

This study implemented masking noise (here, multi-speaker babble) as a listening condition of L2 phonetic training in production, wherein the role of word-type (words vs. non-words) in the instruction material is examined as a second condition. The /æ-ʌ/ contrast was targeted, as L1 Catalan/Spanish bilinguals often assimilate each to their native /a/. To this end, adult EFL learners (N=66) were recruited to undergo high variability phonetic training. The participants were divided into 4 experimental groups and 1 control group (N=15), those in experimental groups being assigned by respective listening condition and then by each word-type used in the training materials. The participants within the experimental groups subsequently received four 45-minute training sessions.

From data collected in a delayed word repetition task, learners' vowel durations and formants were gleaned to calculate both their spectral distance and duration differences from pre- to post-test. The groups trained in noise showed significant improvements in production scores, whereas the group trained in silence did not. Concerning the word-type condition, those trained in noise with non-words showed significant gains after the training, while those trained in silence with non-words did not demonstrate gains from pre- to post-test. The participants trained with words in both conditions did not differ after training. Training in noise with non-words improved learners' distinction of the contrast in production.

Topics: Training, Vowel production

Acquisition of Mandarin vowels by L3 Japanese learners

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Lei Liang, Nankai University

This paper investigates the transfer effects of L1 and L2 to the acquisition of L3 in vowels by means of acoustic experiments, taking 16 (8 males and 8 females) Japanese native speakers whose L2 is English and L3 is Chinese as subjects.

In this study, the vowels of three languages (Chinese/i, ɑ, u, y, ɤ, ɿ, ʅ, ɛ, o, ɚ/; English/ɑː, ɔː, əː, iː, uː, u, e, i, æ, ə, ʌ, ɔ/; Japanese/ɑ, i, ɯ, e, o/) were used as experimental materials. Through the way of measuring 2 formants (F1, F2) of the vowels, this paper investigates the pronunciation errors of Japanese learners. By comparing the different transfer effects of similar vowels, confounding vowels and unfamiliar vowels in the three languages, we explore the origin of the transfer effects. Then, by calculating the vowel distance, we compare the differences in L3 acquisition between the subjects of different L2 proficiency levels, in order to explore the different influence of L2 in the acquisition of L3 at different stages of development.

The preliminary results show that the acquisition of Chinese and English vowels of Japanese learners is still different from that of native speakers, and there are some similarities between L2 and L3. Among them, the similar vowels (e.g. /i/) in L1 have a positive transfer effect on L2 and L3 acquisition, while the confounding vowels (e.g. /ɯ/) have a negative transfer effect, which is more obvious from L1 than from L2 . The unfamiliar vowels (e.g. /ɔ/) that exist in L2 also have a transfer effect on L3 acquisition---being improved with the development of L2, indicating that L2 has a dynamic influence on L3 acquisition, while the vowels (e.g. /y, ɿ, ʅ/) that do not exist in L2 do not have this kind of effect.

Topics: Vowel production

The production of high vowels by L1 and L2 Mandarin speakers

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Research on second-language (L2) speech production has demonstrated that the accuracy of L2 sounds is influenced by speakers' L1 phonological categories and that L2 speech performance is highly correlated with target language experience and phonetic context. The present study aims to explore the production of Mandarin high vowels by native English speakers with different amounts of Chinese learning experience and to evaluate the productions of non-native vowels as a function of consonantal context. To this end, a group of native Taiwan-Mandarin speakers and three groups of American-English speakers at different levels of Chinese experience— naïve speakers, beginners, and advanced learners— participated in a production task, repeating target vowels in alveolar and no-onset contexts embedded in disyllabic Chinese phrases. Results of the study showed that, in terms of production pattern, non-native groups displayed a certain degree of overlap in between vowels whereas native speakers made distinct differences among each vowel category. The naïve group tended to produce the non-native /y/ as a back vowel based on the criteria proposed by Stevens (2002) and learners at the beginning stage could not avoid producing Mandarin /u/ with a fronted feature, resulting in a confusion of distinction among the three high vowels in production. The comparison of each vowel category across speaker group also showed a significant difference for productions of /i/ between L1 and L2 speakers, which contrasts with previous studies suggesting a very similar /i/ category for both languages (Thomson et al., 2009, Wu, 2011). This current study is one of the few acoustic studies comparing high vowel systems between L1 and L2 Mandarin speakers. Additionally, vowel production data by naïve Mandarin speakers will further the understanding of L2 vowel categorization in production which is little known to the extant literature.

Topics: Vowel production

Presentation Session: P1-29

Production of the French high vowels /i y u/ by English-speaking learners and French native speakers in a reading task in tandem language learning

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Claire Pillot-Loiseau, LPP, CNRS / Sorbonne-Nouvelle Paris 3
Sylwia Scheuer, PRISMES, Sorbonne-Nouvelle Paris 3
Céline Horgues, PRISMES, Sorbonne-Nouvelle Paris 3

The French vowels /i y u/ are characterized by their focal nature (Schwartz et al., 1997): the first two formants (F1/F2) are grouped for /u/, the second and third (F2/F3) for /y/, and the third and fourth for /i/ (Vaissière 2007). It has been shown (Flege 1987, Levy 2009) that English-speaking learners of French encounter difficulties in producing these vowels (/u/ with a higher F2, not grouped with F1). These tendencies have been observed mainly in vowels in isolation or in test words in carrier sentences. The goal of this study is to examine these vowels in a French text-reading task (La bise et le soleil) conducted during tandem learning in Paris with 10 pairs of female native speakers of French (NF: aged 17-21) and English (NE: 19-24 years old: 2 from Ireland, 2 from England, 5 from the USA, 1 from Costa Rica; SITAF corpus, Horgues & Scheuer, 2015). NE were recorded twice (before -1.1- and after feedback -1.2- from the tandem partner) during the first tandem session and once 3 months later -2-; NF were recorded once. The first four formants were measured at 25%, 50%, and 75% of the vowel in 5 words containing /u/, 9 words containing /y/, and 8 with /i/; they were statistically compared using ANOVA.

  The results show /y/ and /u/ were not clearly distinguished by NE (/u/ produced with a higher F2 than NF, but significantly lower than that of NE's /y/ in Session 1.1, $F=19$, $p<.0001$); the difference was even greater in Session 2. F1/F2 distance of NF's /u/ was significantly smaller than that of NE ($F=16.4$, $p<.0001$), while no significant difference was found between F2/F3 distance of NF's /y/ and that of NE. The same measurements will be conducted on spontaneous speech of these same speakers in a future study.

Topics: Vowel production

A Comparative Study of L2 English Front Vowels Produced by Chinese and Pakistani English Speakers

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Weijing Zhou, Yangzhou University

With increasing number of Pakistani students in China, English as a lingua franca (ELF) has been playing more and more important role between Pakistani and Chinese students. This paper focuses on the features of L2 English front vowels produced by both Chinese and Pakistani English speakers so as to explore the acoustic similarities and differences between Chinese English (CE)/Pakistani English (PE) and British English (BE) and between CE and PE in terms of duration, F1 and F2. The subjects are 2 RP speakers from Britain, 17 CE speakers and 17 PE speakers doing their postgraduate degrees in China. The data were recorded in the phonetic laboratory at the University of Cambridge and Yangzhou University Laboratory of Phonetics, Hearing and Cognitive Science respectively. All the data were analyzed acoustically via Praat6019_64 and statistically via SPSS 21. The results are: (1) In terms of duration, the majority of front vowels in CE and PE are significantly shorter than those in BE, and there are quite a lot variations for individual vowels between in citation form and connected speech, particularly for /iː, e, æ/ between CE/PE and BE, though no significant differences are found between CE and PE. (2) In terms of tongue position, the F1 and F2 values of target front vowels are very similar in both CE and PE, but quite different between CE/PE and BE, particularly for /iː/ and /æ/ in connected speech. (3) Moreover, there are significant variations between male and female speakers for individual vowels within CE and PE speakers, indicating the effects of phonetic contexts of the vowels and gender and English proficiency of the subjects. These findings shed light on the intelligibility of L2 CE and PE as well as the pedagogy of English Pronunciation in China.

Topics: Vowel productio

Oral Presentations, 31 August (21A1-23C3)

How should we approach teaching to facilitate phoneme acquisition in English as a Foreign Language?

Marc Jones, University of Portsmouth, UK

The current orthodoxy in English as a Foreign Language teaching for listening skills development is to play audio or video files and ask learners to produce meaning from the auditory signal, perhaps taking clues from context in the recordings, using mainly a top-down approach. Some teachers may ask learners to decode the spoken language using a bottom-up approach. While there are advantages in providing exposure to the target language, both of these approaches make the assumption that Japanese learners can perceive differences between English phonemes; unfortunately this may depend on individual learners' current stages of phonological acquisition.

This presentation shall explore the evidence in the literature that indicates use of visual information to stimulate the acquisition of L2 phonology, with particular regard to EFL in the Japanese context as well as drawing on other language contrasts. Models of phonological acquisition such as the Perceptual Assimilation Model (PAM) (Best, 1995), Speech Learning Model (Flege, 1995) and the Native Language Magnet Theory (Kuhl, 1998) shall be addressed, and also use of orthographic information (Showalter & Hayes-Harb, 2013; Mathieu, 2016) and audiovisual information regarding articulatory perception (Hardison, 2018; Glanz et al, 2018) and how these may be effective or otherwise for teachers producing classroom materials.

Topics: Audiovisual processing, Consonant perception, Cross-language and nonnative perception, Teaching and assessment, Vowel perception

Language Experience and Word Familiarity on the Multimodal Perception of L2 Vowels

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How people perceive speech is dependent on a combination of factors, such as language experience (e.g., Best & Tyler, 2007; Bohn & Flege, 1990), speaker familiarity (e.g., Bradlow & Pisoni, 1999), and the availability of visual information in the listening environment (e.g., Massaro, 1987). Studies also indicate that, like native listeners, non-native (L2) listeners make use of lexical knowledge when perceiving and discriminating L2 sounds, supporting the importance for such factors to be taken into account when investigating L2 learners' perceptual abilities. Nevertheless, these studies remain uncommon and no research has explored how lexical familiarity influences L2 speech perception in environments where visual information is provided.

Accordingly, the current study investigated the contributions of audiovisual information and word familiarity on the perception of French vowels by native speakers and L2 learners. The research questions that guided the study were:

1. How does vowel identification accuracy vary across different modalities of presentation (AV, A-only, V-only) in relation to language experience?

2. Does subjective word familiarity affect L2 vowel (AV) perception?

Thirty-four intermediate learners of French and 33 L1 listeners performed a forced-choice vowel identification task in AV, A-only, and V-only modalities (60 stimuli per modality). The L2 participants also completed a vocabulary knowledge test of the words presented in the perception experiment to explore whether subjective word familiarity affected speech perception.

The results showed that patterns of confusion differed across modalities, and provided evidence that the L2 learners had not yet acquired sensitivity to lip-rounding but were able to make use of some of the visual information. A significant relationship was also found between subjective word familiarity and AV and A-only (but not V-only) perception of nonnative contrasts, thus confirming and extending the findings of previous studies to the audiovisual speech perception domain.

Topics: Audiovisual processing, Cross-language and nonnative perception, Vowel perception

Can watching captioned movies improve L2 pronunciation?

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Joan C. Mora, Universitat de Barcelona

Bimodal input exposure provides training in the mapping of phonological and orthographic word forms, potentially triggering updates in their phono-lexical representations, leading to L2 pronunciation development. Captions enhance lexically-guided perceptual learning by facilitating speech segmentation (Charles & Trenkic, 2015; Mitterer & McQueen, 2009). However, no research to date has investigated the impact of extended exposure to captioned video on L2 pronunciation learning by directly testing its effects on speech processing skills and segmental perception and production.

Adult Spanish/Catalan learners of English were tested on speech processing skills: segmentation (shadowing), speed of lexical access (animacy judgment) and sentence processing (timed true/false decision) and segmental accuracy in perception (ABX discrimination) and production (accentedness ratings) before and after an input-based treatment consisting of 8-weeks of exposure to the British TV series Luther. Eye-tracking data was gathered at pre- and post-test and used to gauge changes in their caption-reading behaviour. Participants (N=90) were randomly assigned to one of four experimental conditions determined by two viewing modes (with or without captions) and two task focus conditions (phonetic form or meaning). A control group (N=13) was not exposed to the treatment.

Results showed benefits in speech segmentation and speech processing skills at sentence level and in foreign accent reduction for all experimental groups. Larger gains in accent reduction were observed for the uncaptioned viewing mode in the phonetic-form task focus condition and in the captioned viewing mode in the meaning-focused condition. Changes in eye-gaze behaviour (fixation counts and duration) for the uncaptioned viewing groups at post-test reflect less attention to captions and a consequent increase in auditory processing. The results are explained through cognitive load effects (Mattys & Wiget, 2011), relating gains in phonological accuracy to learners' reading behaviour and managing of their attentional resources. Implications for L2 pronunciation teaching and learning will be discussed.

Topics: Audiovisual processing

Shadowing as a practice for speech perception

Yo Hamada, Akita University

Satoko Suzuki, Ibaraki University

This study examined if shadowing practice enhances Japanese English learners' speech perception skills and if it does, whether it enhances the speech perception of the difficult phonemes for the Japanese English learners. Shadowing, the act of simultaneous vocalization of what one is listening to, has been recognized as a practice for speech perception and listening comprehension skill improvement (e.g., Hamada, 2016) and pronunciation development (e.g., Foote & McDonough, 2017). However, the prior studies only indicate shadowing helps learners' perception skill improvement, not specifying which phonemes or the reasons why it occurs. Given these, this study attempts to examine which phonemes shadowing helps English learners perceive better. A total of 21 Japanese university students were involved in the study (11 for shadowing group and 10 for control group). The shadowing group was engaged in a shadowing project, in which they chose a 2-3 minute video (e.g., TED) individually, and practiced shadowing the model video for 3 months to simulate the model. The control group did not engage in the shadowing project. An identical 20-item pre- and post- dictation tests were given. The test consists of 20 words from GSL 1000-2000 level, which contains difficult segmental features for Japanese English learners such as /r/, /l/, /f/, /v/ /θ/(Saito, 2013). A two-way repeated measure of ANOVA showed a significant interaction effect [F(1, 19) = 5.61, p<.05, η_p^2=23] and only the shadowing group improved, gaining by 1.63 points from 9.55 to 11.18, while the control group showed no gain, from 8.50 to 8.40. A further analysis of individual items reveals that their score progress on fricatives (v/ f) was noticeable. The results are discussed, referring to shadowing mechanism, including attention and perceptual learning. In conclusion, shadowing practice improves Japanese English learners' speech perception skills of difficult phonemes especially fricatives.

Topics: Consonant perception, Cross-language and nonnative perception, Teaching and assessment, Training

The development of comprehensible L2 speech through implementation of semester-long CBI preparatory courses.

Shuhei Kudo, Waseda University

It is commonly believed in L2 pronunciation studies that developing comprehensible L2 speech is a realistic and attainable goal for L2 learners (Saito et al., 2016). Furthermore, comprehensible L2 speech is crucial in academic settings where L2 learners need to perform oral tasks in L2 more smoothly, such as content-based instruction (CBI) in which academic contents are delivered in L2, which has been newly introduced into higher education in Japan. Such a content course and associated preparatory courses are expected to develop learner's L2 oral skills because those classes have much exposure to the target language (Harada, 2017). However, it remains to be clarified whether their L2 speech become more comprehensible for a variety of L1 listeners through the implementation of the preparatory content courses. To investigate an educational effect of the courses on the development of L2 speech comprehensibility, this study addresses the following questions: (1) is there a statistical difference in comprehensibility score after one semester of the courses? and (2) is there any effects of rater's L1 difference on evaluation? This study recruited 36 Japanese students as speakers who took CBI preparatory courses in a university, and 22 non-native English speakers as speech raters (10 Japanese, five Chinese, five Korean, one Vietnamese). The English monologue speeches were elicited from the speakers at the beginning and the end of the term, and then the listeners evaluated their speeches using a 9-point Likert scale of comprehensibility (Munro & Derwing, 1995). The results showed that the effect of rater's L1 difference on the comprehensibility score was not significant, but implementation of CBI preparatory courses had a statistically significant effect on the score at a .05 level ($\eta^2 = .03$), concluding that the semester-long CBI preparatory courses made their English speech slightly more comprehensible for a variety of non-native English speakers.

Topics: Cross-language and nonnative perception, Intelligibility and comprehensibility, Teaching and assessment

Examination of the L1 vowel drift: An acoustic analysis of Japanese vowels produced by Japanese
learners of English

Aya Kitagawa

This study aimed to examine the influence of L2 vowels on L1 vowels, following the postulates outlined in the Speech Learning Model (Flege, 1995). This model posits that, for bilingual speakers, L1 and L2 phonetic categories exist in a common phonological space, and phonetic categories for L1 sounds evolve over life span. However, a limited number of studies have addressed how L1 categories evolve by learning L2 phones—especially, at the level of the entire vowel space (Chang, 2011). Therefore, this study focused on four Japanese vowels that are distant from each other in the vowel space, /i, i:, a, a:/, and addressed three research questions: 1) whether all four vowels drift, 2) in which direction they move when the drift occurs, and 3) whether the drift depends on the learning level. Target vowels surrounded by two consonants in a CVCV context were elicited from Japanese words read aloud by twenty-four Japanese learners of English. These participants were evenly divided into three learning levels based on overall intelligibility and accentedness, which were rated by a native English speaker. The data were acoustically analysed; F1 and F2 values were obtained at the midpoint of the target vowels at which the formant movement was most stable. These data were then statistically analysed using a two-way mixed-design multivariate analysis of variance. The results showed that the high-level group produced F1 /a/ and /a:/ values that were significantly lower than the other groups. In contrast, the other variables did not yield a significant difference between the groups. Thus, this study revealed that 1) the drift did not occur for all vowels, 2) tongue height increases when the drift occurs, and 3) the drift only occurred for vowels produced by proficient learners. These findings will contribute to elucidating how L1 vowel drift occurs in general.

Topics: Vowel production

The role of imitation in L2 pronunciation

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What factors underlie the large individual differences that exist in L2 pronunciation? Recent research suggests that better imitators may have better L2 pronunciation. However, while studies using perceptual ratings have found evidence of a role for imitative ability (e.g., Reiterer et al., 2011, Front. Psychol.; Reiterer et al., 2013, Front. Psychol.), one study in which performance was evaluated acoustically found a dissociation between L2 imitation and pronunciation (Llompart & Reinisch, 2018, Lang. Speech). In the present study, we explore different aspects of verbal imitation such as intentionality (i.e., whether imitation is deliberate or not), target language (i.e., familiar vs. unfamiliar languages), and memory (i.e., immediate vs. delayed imitation), and their contribution to L2 pronunciation performance using acoustic measures. To this end, 80 native Dutch speakers performed different listen-and-repeat tasks assessing their 1) non-deliberate tendency to converge to the pronunciation of Dutch words spoken by a non-native (Croatian) speaker, 2) ability to deliberately imitate words in an unfamiliar language (Basque), 3) ability to deliberately imitate Dutch words in an unfamiliar (Greek) accent, and 4) ability to deliberately imitate the non-native pronunciation of those Greek-accented Dutch words from memory a day later. Samples of L2 pronunciation were elicited with picture naming. Imitative ability and L2 pronunciation will be assessed via acoustic measures of target sounds. The results will help elucidate the role of imitation in L2 pronunciation, while exploring different effects on imitation of factors including intentionality, target language, and memory load.

Topics: Psycholinguistics, Vowel production

The influence of topic on vowel realization in L1 and L2 mono- and bidialectal speakers

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Research shows that bilingual and bidialectal speakers vary in production by topic (Gnevsheva, 2015; Walker, 2014) but we do not know whether bilingual speakers vary when they have been exposed to two dialects.

We address the question whether the topic of a reading task, when heavily associated with a particular dialect area, can influence how L1 and L2 mono- and bidialectal speakers realize a linguistic variable. This will provide us with information about the processing of indexical information.

Forty-five participants varying in native language (first language [L1] English vs. L1 Russian / second language [L2] English) and their previous English dialect exposure (monodialectal Australian [first dialect, D1] vs. bidialectal American D1 / Australian second dialect [D2]), were grouped as follows: L1D1, L1D2, L2D1, and L2D2.The participants were audio-recorded reading a text on a neutral topic, one about the USA and one about Australia. F1 and F2 formants were extracted for all monophthongs and normalized. Linear mixed effects models were fit to the data with the normalized F1 and F2 for KIT and DRESS as the dependent variables.

The results show that L2 speakers produce fronter KIT (more Australian-like) vowels in the Australian text passage (than the L1 speakers). All groups show a trend for a lower DRESS (more American-like) production in the American text passage and a fronter DRESS (more Australian-like) realisation in the Australian text passage. The results suggest that an indexical link exists between vowel production and topic for all four speaker groups and that the indexical link between KIT and topic is stronger than between DRESS and topic.

The results are important as they show that indexicality operates similarly for L1 and L2 mono- and bidialectal speakers on the phonetic level while Szakay et al. (2019) show that weaker indexical ties exist for L2 speakers on the lexical level.

Topics: Bilingualism and multilingualism, Modeling, Sociophonetics, Vowel production

Non-native discrimination of vowels, consonants, and phonemic length is better predicted by perceptual similarity than by perceptual assimilation category types

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Franziska Kruger, Indiana University Bloomington

Ryan Lidster, Indiana University Bloomington

Predicting how non-native sound contrasts vary in discriminability is difficult because language experience warps the listener's perceptual space (Best & Tyler, 2007; Flege, 2007; Kuhl et al., 2008). Researchers commonly use a Perceptual Assimilation (PA) task to make predictions about non-native discrimination performance. This task has several well-known limitations: its applicability is constrained due to its reliance on the existence of clear L1 categories, the analysis relies on subjective thresholds for what constitutes a "categorized" sound, and previous results have not always matched well with discrimination performance (e.g., Harnsberger, 2001).

In order to avoid these limitations, we propose two alternative approaches that focus on the perceptual similarity of non-native sounds to each other. We apply a free classification task (Clopper, 2008) used in other domains of psychology to the perception of non-native sounds, and convert PA task data into overlap scores based on Levy (2009). In six experiments, we tested American English listeners on their perception of German vowels, Finnish vowels, Finnish phonemic length, and Arabic consonant contrasts, and Japanese listeners on their perception of Finnish vowels and Finnish phonemic length. Across all six experiments, perceptual distances obtained from the free classification tasks and the overlap scores derived from the PA tasks strongly correlated with discrimination performance on AXB and Oddity tasks. Correlations were never weaker than 0.7 and were as high as 0.94. While a traditional PA analysis performed best on consonant perception, it never outperformed either of the analyses based on perceptual similarity, and for some experiments, the perceptual similarity methods predicted discriminability with much more success. These approaches involve very few arbitrary decisions and therefore facilitate replication. Perhaps more importantly, either approach can be applied to the investigation of non-native perception across a wide range of phonological phenomena, such as length, with consistently high predictive power.

Topics: Consonant perception, Cross-language and nonnative perception, Vowel perception

Listening effort during speech understanding in a second language: the contribution of semantic context.

Giulia Borghini, University College London
Valerie Hazan, University College London

Current evidence demonstrates that the presence of a background noise is much more detrimental for non-native than for native listeners when listening to speech. Moreover, we know that listening effort is increased for non-native compared to native listeners, even when the intelligibility levels are equated across the two groups.

Here, I discuss results from a pupillometry study exploring listening effort during a speech perception task in noise. The listening task featured lists of 12 sentences that were either semantically related to each other, or unrelated. In order to investigate the contribution of semantic context to listening effort, results were analysed by grouping sentences into three sections (beginning, middle and end section).

Participants included 21 Italian learners of English, and 18 native English controls. An adaptive procedure was used to match intelligibility levels across participants. An intelligibility level of 80% was targeted.

Non-native listeners showed a significantly greater pupil response, reflecting increased cognitive effort, compared to native listeners when attending to speech in noise. Additionally, we only found a significant reduction in the peak dilation between the beginning and end sections of the sentence block when native participants were attending to related compared to unrelated sentences. This benefit from context was not replicated for the non-native listeners. Results suggest that non-native listeners do not benefit in terms of a reduction in listening effort as native listener do when they are provided with consistent semantic context.

Topics: Cross-language and nonnative perception

Perception and production of voicing contrast in French stops: A comparison between Suzhou Wu and Mandarin speakers

Ning Wang, Paris Sorbonne Université

Didier Demolin, Paris Nouvelle Sorbonne

The acquisition of voicing contrast in French stops /p/-/b/,/t/-/d/,/k/-/g/ is a key problem for mandarin speakers learning French since they only distinguish between voiceless and voiceless aspirated stops /p/-/pʰ/,/t/-/tʰ/,/k/-/kʰ/. Nevertheless, Suzhou speakers from Wu region have the phonetic voicing contrast but only in intervocalic position due to the neutralization of Tone Sandhi (Chao 1970, Wang 2018). According to the Speech Learning Model (SLM) (Flege 1989, 1995, 2003), non-native phonemes are mapped to position sensitive allophones in the L1 whereas the Perceptual Assimilation Model (PAM) (Best 1995, Best & Tyler 2007) posits that the perceptual assimilation targets the similarities in the higher-order invariants which are relatively constant across positions. These predictions require answering two questions: 1) Will Suzhou learners acquire intervocalic French voicing contrast better than mandarin group? 2) Will Suzhou learners acquire initial voicing contrast as easy as intervocalic one?

30 first-year French majors (15 suzhou and 15 mandarin) of the same class participated in 4 experiments. The first was a AXB task with 30 minimal pairs forming 60 triadic trials with a 0.5s inter-stimulus-interval (e.g., /gute/-/kute/-/gute/, /bado/-/bato/-/bato/). Participants were asked to indicate whether X corresponded to A or B. Secondly, they were asked to choose from each French minimal pair after hearing one sound. (e.g., goûter-couter). Thirdly, they were asked to read random ordered stimuli in a carrier sentence: "Je connais xx en français." (I know xx in French). Fourthly, they were asked to pronounce in French the name of 15 objects containing the consonants of interest displayed on a screen. Results of the experiments suggested that Suzhou group showed a higher intervocalic perceptual accuracy than mandarin speakers with a better French voicing production in both positions. Therefore, the non-native contrasts are at least assimilated to native specific-position allophones in perception but are likely to be produced across positions.

Topics: Attitude and identity, Bilingualism and multilingualism, Consonant perception, Consonant production, Cross-language and nonnative perception

Presentation Session: 22B1

Effects of word knowledge on L2 phonolexical representations: an L2 vowel training study

Ingrid Mora-Plaza, Universitat de Barcelona

Although non-native phonological systems have been shown to remain malleable over the lifespan (Flege, 1995), the extent to which learners can distinguish L2 phonological contrasts in minimal-pair words is constrained by proficiency (Veivo & Järvikivi, 2012), orthography (Simonchyk & Darcy, 2018), degree of lexical entrenchment (Diependaele et al., 2013) and vocabulary size (Tyler, 2018). As suggested by Darcy and Holliday (2018), inaccurate L2 phonolexical representations may be easier to change for recently acquired "new" words than for "older" words. The present study examines changes in L2 speakers' phonological representations for well-known words, recently-learned words and non-words after L2 vowel training.

L1 Catalan-Spanish adult learners of L2 English (N=26) were trained (4x45 min) on the perception and production of a difficult British English vowel contrast (/æ/-/ʌ/) through discrimination, identification and imitation tasks based on high-variability monosyllabic word and non-word stimuli. Prior to each training session, the meaning and pronunciation of English words unknown to participants were taught auditorily and orthographically through a word learning task. Gains in perception (accuracy & RT scores) and production (spectral distance and duration distance scores) for well-known, recently-learned words and non-words were assessed through categorical ABX discrimination and delayed word repetition tasks. Word knowledge was determined through a word familiarity questionnaire.

The results revealed that learners' perception of /æ/-/ʌ/ was more accurate for recently-acquired words and non-words (p<.001) than for well-known words. In production, gains in spectral and duration distances were also higher for recently-acquired words, but of a smaller magnitude. The control group (N=15), who did not do the training, did not improve in either perception or production. These findings suggest that the malleability of phonolexical representations in well-known words is severely limited, whereas those of new words acquired under intensive phonetic training conditions are more accurately formed and less compromised by previous phonetic experience.

Topics: Training, Vowel perception, Vowel production

Generalization Effects of Phonetic Training on L2 English Production of /æ/-/ʌ/

Mireia Ortega, Universitat de Barcelona
Eva Cerviño-Povedano, Universitat de Barcelona

Production training has been shown to lead to consistent gains in the production of L2 vowel contrasts, especially for confusable pairs of L2 sounds that are mapped onto a single L1 category (Aliaga-Garcia & Mora, 2009; Kartushina et al., 2016). Spanish-Catalan learners of English, for instance, tend to perceptually assimilate English /æ/ and /ʌ/ onto their only low L1 vowel /a/ and to produce this contrast inaccurately (Cebrian et al., 2011), even though /æ/ and /ʌ/ differ acoustically in quality and duration (Deterding, 1997). Phonetic training studies have typically assessed benefits in production by using sets of testing stimuli consisting of trained and untrained nonwords or words, and gains to untrained stimuli have been taken as learning evidence. However, the role of stimuli type in generalization of training gains to L2 sounds in words embedded in sentence contexts is largely under-researched (cf. Olson, 2019). This study examines whether phonetic training gains in the production of English /æ/-/ʌ/ in isolated words generalize to the same words elicited in meaning-focused sentence contexts as a function of the training stimuli used. Spanish-Catalan adult learners of English (N=26) were trained in 4 45-minute sessions on the perception and production of /æ/ and/ʌ/ through high-variability stimuli consisting of either nonwords or words. An untrained control group (N=15) also performed the pre- and post-tests. Production was assessed before and after training through a delayed word and delayed sentence repetition tasks. Improvement was measured through normalized Bark-converted spectral distance and duration scores (Flege et al. 1997).

The results showed gains in /æ/-/ʌ/ spectral distance for all trainees in isolated words, but only participants trained on words could generalize gains to the same words in sentence contexts, suggesting that phonetic training with words may lead to more robust improvement in L2 pronunciation accuracy than phonetic training with nonwords.

Topics: Training, Vowel production

When German Rhythm meets French Orthography: An Analysis of Schwa in Austrian Interphonology
(0-B1)

Julia Kamerhuber, University of Vienna

Elissa Pustka, University of Vienna

French schwa or 'mute e' might seem easy to pronounce for German-speaking learners as their L1 provides a schwa phoneme corresponding to the letter <e>. Nevertheless, the phonetic realization is not the same: While German schwa resembles [e] or [ɛ], French schwa is rather pronounced as [œ] or [ø] (Bürki et al. 2011). In addition, grapheme-phoneme-correspondences are not identical and both French and German <e> can also correspond to /e/ or /ɛ/. However, the rhythms of the two languages are completely different: French is a syllable-timed language with phrase-final stress, whereas German is a stress-timed language with distinctive word accent (Ramus et al. 1999). Correspondingly, German schwa is the result of a continuous reduction process and French 'schwa' a lexicalized [œ]/[ø], deletion or vowel/zero-alternation (e.g. premier 'first', s(e)main(e) 'week').

Our paper analyzes this complex interaction in the data of the Pro²F project, which is based on the (I)PFC program (https://www.projet-pfc.net). Our corpus contains 110 hours of speech from 145 Austrian pupils aged between 12 and 18 years. In contrast to the few existing studies on schwa in learner French (Uritescu et al. 2002 etc., Thomas 2001 etc., Isely et al. 2018), we also consider German recordings of the speakers.

The first analysis shows that learners often produce [e] instead of schwa, especially in the first syllable of polysyllabic words as semaine (40% in reading), whereas they delete them correctly in the middle and final syllable. In monosyllables, they tend to confuse [e] and [ə] despite clear orthographic markers, e.g. in the definitive articles le [lə] (singular) and les [le] (plural). Furthermore, additional schwas appear in medial syllables as in télévision 'television'. These results suggest that L1 rhythm seems to have a greater influence on schwa than spelling pronunciation.

Topics: Intelligibility and comprehensibility, Rhythm, Stress and accent, Vowel production

Acquisition of L2 English Foot Rhythm by Native Speakers of Japanese

Takayuki Konishi, Waseda University

Second Language (L2) pronunciation teaching used to focus on segments rather than prosody at least in the beginner level, but the recent trend is to start teaching prosody in early stages, sometimes prior to the teaching of segments. Derwing and Munro (1997) reported the importance of teaching prosody in enhancing L2 English comprehensibility. Despite these, however, there are much less studies on L2 prosody than those on L2 segments. The current study focuses on L2 English foot rhythm, one of the fundamental aspects of English prosody. Using a corpus of 183 Japanese learners of English, as well as 25 native speakers, reading out 'the North Wind and the Sun,' Japanese learners' manifestation of foot has been analysed in terms of a)the number of syllables in a foot and b)the duration of each foot. The results show that the beginner learners have produced one-syllable feet the most, with fewer instances of feet with more syllables. On the other hand, the advanced learners and the native speakers produced three-syllabled feet the most, suggesting that may be the optimal number of syllables in English foot. Furthermore, the beginner learners, but not the advanced learners, had significantly shorter feet than the native speakers, both in terms of the mean number of syllables ($p < .05$) and the mean duration normalised for speech rate ($p < .01$), which suggests that Japanese advanced learners of English are capable of accommodating more syllables in a foot and producing feet with greater durations.

Topics: Rhythm

Building an ASR-free automatic tool for measuring the Speech Fluency of Japanese Learners of English

Lionel Fontan, Archean LABS
Maxime Le Coz, Archean LABS
Mariko Kondo, Waseda University — SILS

Speech fluency can be described as "the degree to which speech flows easily without pauses and other disfluency markers" (Derwing & Munro, 2015). Achieving a native-like speech fluency when learning a foreign language (L2) is therefore an important goal, and students' progresses should be monitored in this regard.

However, the evaluation of speech fluency is usually conducted by subjective, time-consuming means. To overcome these issues, some automatic-speech-recognition (ASR) systems have been used to predict speech fluency (e.g., Cucchiarini, Strik & Boves, 2000). More recently, automatic systems relying solely on the computation of low-level acoustic measures have been used to predict speech fluency, both for pathological speech (Lustyk, Bergl, & Cmejla, 2014) and L2 speech (Fontan, Le Coz, and Detey, 2018). One noticeable advantage of these systems is that they are language-independent.

In this communication we present a speech-fluency measurement system relying on similar low-level signal-processing measures, from the most part derived from the forward-backward-divergence segmentation algorithm (André-Obrecht, 1988). The system is used to predict speech fluency for Japanese learners of English. More precisely, 25 native English speakers and 65 Japanese speakers were recorded while reading out loud a five-sentence-long passage from "The north wind and the sun". Four native American-English speakers, with a solid background in phonetics, were asked to judge every sentence on four dimensions: speech rate, regularity of speech rate, fluidity of coarticulation, and overall phonetic fluency. The inter-rater agreement is rather high for the four dimensions, with strong and highly significant correlation coefficients observed between expert ratings. The relationship between objective measures and expert ratings are discussed in details, and the predictive power of the system is compared to that of a standard HMM-based ASR system using the Julius engine (Lee & Kawahara, 2009).

Topics: Rhythm, Teaching and assessment

Production of Mandarin tones by L1-Spanish young learners

Lucrecia Rallo Fabra, Universitat de les Illes Balears
Xialin Liu, Centro Educativo Hua YuE
Si Chen, The Hong Kong Polytechnic University
Ratree Wayland, University of Florida (Gainesville)

Tonal languages such as Mandarin Chinese use pitch differences to signal lexical differences (Yip, 2002). In contrast, intonational languages such as Spanish do not use pitch for lexical contrast, variations of pitch contours indicate attitudinal or grammatical changes, not lexical ones (Gussenhoven, 2004). Mandarin Chinese has four distinctive tones, namely, high-level (tone 1), high-rising (tone 2), low-dipping (tone 3) and high falling (tone 4). Thus a word like ma may have four different meanings depending on the pitch contour. If a Spanish speaker learning Chinese does not produce the four Mandarin contours, intelligibility can be seriously compromised. The aim of this study is to investigate the production of the four Mandarin tones by a group of school-aged Spanish learners of Chinese (n=12) and a group of native Chinese children (n=4) with a mean age of 9,5 years. The participants were recorded in a quiet room at the school premises while performing an imitation task in which they produced 32 monosyllabic words embeded in a carrier phrase. Time-normalized pitch contours were extracted at 20 consecutive points using the ProsodyPro script (Xu, 2013) for Praat. The F0 values were then converted to logarithmic Z-scores to normalize F0 variation across talkers (Rose, 1987; Zhu, 1999) and submitted to growth curve analysis (Mirman, Dixon & Magnuson, 2008; Mirman, 2014) to compare the surface F0 contours of the four tones. A significant difference in the F0 shapes produced by the two groups was found for all four tones, but a significant difference in F0 height was found only for Tones 2 and 3. The findings suggested that native-like production of pitch contour may be more challenging than pitch height due, perhaps, to speakers of non-tonal languages' greater attention to the former than the latter F0 dimension. (Lu, Wayland & Kaan, 2015).

Topics: Intonation, Lexical tones

Tone Training: Connecting Meaning to Form

Bei Yang, Sun Yat-sen University

Tones are one of the biggest challenges for learning Chinese, especially for speakers who lack tonal experience in L1. Previous research showed that audio-visual training of tones is effective in laboratory and it is a trend to use visual feedback paradigms in language teaching. However, such trainings and instruction focused on phonological forms only, and ignored many relevant mental processes. Therefore, the current study explored whether meaning-related training could facilitate tone acquisition more effective; how disyllabic tones develop according to the difficulty level; and whether the improvement could extend to untrained words, i.e. whether the training could improve the process of tone production. Two audio-visual training paradigms were designed. Ten American learners of Chinese received a Focus on Form training, which employed a picture-naming task, and the participants received contextual and meaningful inputs; 9 received a Focus on FormS training, which employed a read-aloud task, and the participants received de-contextual inputs without meaning; and 9 received no training. After training, all participants took the assessment test five times: a pretest, a post-test, and three retention tests. Then, five native speakers of Chinese evaluated all the assessment. ICC for inter-rater reliability was 0.7772, indicating the raters were consistent in their rating.

There are three major results. First, both training methods were significantly effective yet Focus on Form training is significantly more efficient. Second, the trained words were improved in both groups, yet untrained words were improved significantly only after FonF training. Third, easily produced tone patterns were improved significantly only after FonF training, while the most difficultly produced tone patterns were improved significantly in both groups and the retention was better after FonFS training. It revealed that there is a threshold for lexical tone acquisition. When leaners' proficiency passes this threshold, tonal process would be connected to meanings more.

Topics: Lexical tones, Training

How do Japanese learners produce continuation in French?

Rachel Albar, Laboratoire de Linguistique Formelle, Paris 7

Hiyon Yoo, Laboratoire de Linguistique Formelle, Paris 7

In French, rising contours can be associated to a syntactic, metrical, interactional or phrasing function (Mertens 2011, Portes et al. 2005, Portes et al. 2007, Kaminskaia 2016).

We refer to the non-final contours as 'continuation'. Continuation is often associated with a rise of F0 and a lengthening of the stressed vowel.

In Japanese, Boundary Pitch Movements (BPM) play essentially a role in speech interaction where the high boundary tone (H%) is a turn-holding cue (Igarashi, 2015). Moreover, Japanese does not use rising contours to mark specific syntactic positions since its prosodic boundaries are usually marked by a low tone (L%). BPM are less frequent than continuative contours in French and the vowel is not always lengthened (Venditti et al. 2008, Maekawa et al. 2002).

The aim of the present study is to investigate how Japanese learners deal with continuation in French in semi-spontaneous speech. Our main hypothesis is that continuation is not a phonological entity dealt with in the same way in the two languages. Thus, we predict that Japanese learners produce continuation with more low boundaries and less lengthening of the stressed syllable, even in syntactic or metrical contexts where only a rising continuative contour is allowed.

For data collection, we used a picture-description task. 17 Japanese learners of different performance levels described the pictures with their own words.

We annotated the data and measured the accuracy of the contours (following to what is expected in French), F0 and duration of each segment.

General results that will be discussed show that Japanese learners tend to produce falling patterns in contexts where a rising contour is expected. However, the results are speaker dependent. Even when rising occurs, lengthening is missing showing that in the process of phonologization of the rising contour, the parameter of duration is more difficult to acquire.

Topics: Intonation

Presentation Session: 23B1

Acquiring a phonological L2 French sociolinguistic marker: a first assessment of Swiss learners' schwa production

Romain Isely, ELCF - University of Geneva

Mastering the sociolinguistic dimension of speech is as important as the mastery of the structural linguistic system itself to communicate fluently in a foreign language (Regan and al., 2009). A good indicator of sociolinguistic competence in French is the management of schwa – a particular vowel that can be pronounced or omitted without changing the word/sentence meaning (e.g. "petit" can be pronounced /pəti/ or /pti/, both meaning "small"). In this presentation, we examine the schwa production of Swiss Italians and Swiss Alemannic learners of French. Using an alphanumeric coding system developed for schwa in the methodological framework of the IPFC project (Detey and al., 2016), we looked at the effect of learners' immersion in a French-speaking environment, crossed with other variables – task (text reading or spontaneous conversation) and the type of word containing the schwa (syllabic length) – to look for potential impact on schwa deletion. Our results show an immersion effect on two levels. First, for the Swiss Alemannic learners – divided into two groups, with and without immersion experience – we note more schwa deletion for the group with immersion experience. Second, for the Swiss Italian learners – who all had an immersion experience of different durations – it appears that the deletion rate increases the longer the immersion period is. Finally, we observe that the immersion effect on the schwa is not global but mainly in monosyllabic words produced in the conversation task. These first results reveal contexts where the effect of the immersion is stronger, which allows us to further our understanding of how the immersion experience can be beneficial to learners and could highlight, in turn, how to focus on schwa in L2 classes for learners who cannot benefit from any other immersive experience.

Topics: Sociophonetics, Teaching and assessment, Vowel production

Presentation Session: 23B2

The interaction between (un)expected speaker ethnicity and accent combinations on response times

Noortje de Weers, Simon Fraser University

In recent years, there has been a growing interest in the relationship between speech and social processes, as increasing attention is now given to how a speaker's physical appearance (as opposed to their actual accent) can influence the perception of spoken language. The method of choice to investigate this phenomenon has been to pair photographs of ethnically-different faces with audio clips of differently accented voices to see which face-voice combinations elicited the highest accentedness ratings or the lowest transcription accuracy scores. Rather than eliciting similar overt evaluations of speech, this study makes use of a sentence verification task to tap into listeners' subconscious language processing mechanisms. When required to decide on the truthfulness of sentences in a speeded task, listeners are not able to overthink –or even change– their answers, such that results more accurately reflect true processing as opposed to post hoc influences of bias.

To create realistic guises, four women (2 Japanese and 2 white Canadian) were video recorded while uttering 56 true and false sentences in English. In order to measure the effects of expected face and accent combinations (e.g., Asian face + Japanese accent) and unexpected ones (e.g., White face + Japanese accent) on reaction times, the four speakers' voices and faces were mixed and matched to create 16 new guises. Results showed that listeners took significantly longer to respond to foreign-accented voices than to native voices. However, neither speaker ethnicity nor incongruent face and accent combinations were found to cause processing latencies. The lack of evidence for listener bias or an expectation mismatch effect suggests that this phenomenon may simply not exist on a processing level.

Topics:Attitude and identity, Audiovisual processing, Cross-language and nonnative perception, Intelligibility and comprehensibility, Psycholinguistics, Sociophonetics

Presentation Session:　23B3

Class or Claas? A Phonetic Index for English Teachers

James H. Yang, National Yunlin University of Science and Technology, Taiwan

Received Pronunciation (RP) holds prestige not only in the UK, but also in many Outer and Expanding Circle countries and even in the US, but the TRAP-BATH split (TBS) in RP, which refers to the shift from the vowel /a/ to /ɑː/, has still remained ambiguous because this sound shift contains inconsistent realizations that occur in identical codas, as illustrated in such lexical pairs as class but gas, path but math, last but enthusiast. What makes this sound feature more complicated is socio-phonetic variation because it relates to variables like gender, class, region, and education. Although these socio-phonetic discoveries have enhanced our understanding of how the TBS is used in the UK, little is still unknown about BATH words, which are pronounced with /ɑː/ by RP speakers, but with /æ/ by speakers of General American English for TRAP words as well. To provide RP learners with a linguistic index to acquire BATH lexical set, this study expanded Wells' (1982) study by including additional 16 phonetic environments, which generated a total of 304 relevant words in 30 environments for examining their pronunciations defined by three British English dictionaries. The findings show that 17 out of the environments did not undergo the sound change regularly, and five of them did not trigger it at all. If these environments were removed from the word list, the average occurrence rate of the TBS was very high (82%). Accordingly, the TBS appears as a conditioned sound pattern if well-defined by its phonetic environments. The presentation will detail the findings and discuss implications for English pronunciation teaching.

Topics: Sociophonetics, Vowel perception, Vowel production

A formal account of how L1-Mandarin learners treat the L2 Portuguese rhotic

Chao Zhou, Universidade de Lisboa
Silke Hamann, University of Amsterdam

European Portuguese (EP) /ɾ/ is notoriously problematic for L1-Mandarin learners and its acquisition is conditioned by prosodic position: while in onset learners substitute /ɾ/ with [l], in coda they delete the segment, insert a schwa, or substitute it with the Mandarin rhotic [ɻ] (Zhou, 2017).

In this study, we formalise the observed prosodic effect in a generative model that integrates phonetics, phonology (Boersma, 2011) and orthography (Hamann & Colombo, 2017). Assuming that initially learners use their L1 grammar to interpret L2 input (Escudero, 2005), we created a perception grammar based on formant and duration values for Mandarin liquids (from Smith 2010) and let it categorise the EP auditory form [ɾ]. In onset, [ɾ] is categorized as /l/ because its acoustic value is closest to /l/, coinciding with the literature (e.g. Patience, 2018). The same categorization is prevented in coda since Mandarin does not allow /l/ in coda position (Duanmu, 2007), which leads learners to employ deletion or epenthesis. These perceived phonological forms are then stored faithfully and used as such in the production process.

Substitution with Mandarin rhotic [ɻ] in coda position cannot be explained by perception, as EP [ɾ] is not categorized as /ɻ/. We therefore propose orthography plays a role, as the grapheme <r> represents both EP /ɾ/ and Mandarin /ɻ/ (in Pinyin). Unlike L1 acquisition, Chinese adult learners acquire the sound structure of EP words in parallel with the written forms, and store both in the lexicon. In production, phonological and orthographic representations are activated and compete in the creation of a surface form. In our modelling, L1 grapheme-phoneme mapping may override phonological mapping, yielding the production of [ɻ].

We conclude that only a bidirectional language model that integrates phonetics, phonology and orthography can appropriately account for the L2 speech learning process.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception, Modeling

L2 perceptual impact on loanword adaptation of English vowels in Korean

Mi-Hui Cho, Kyonggi University
Shinsook Lee, Korea University

The loanword adaption process tends to generate forms in recipient language which are perceptually most similar to the source production in donor language. Specifically, de Jong and Cho (2012, p. 349) showed that perceptual influence is the most important factor in English consonant adaptation in determining the form of borrowed words in Korean because a strong commonality is attested between loanword mapping and perceptual mapping (R^2=.727). Given that vowels and consonants differ with respect to auditory-perceptual, dynamic, and functional properties, the current study investigates the degree of perceptual influence on overall loanword adaptation of English vowels in Korean. In particular, the present study testes the possibility that perceptual influence on English vowel adaptation in Korean is less powerful compared to that of English consonant adaptation because perception of vowels is less categorical and less quantal and further, vowels are less related to word identification compared to consonants (Fry et al., 1962; Stevenson & Keyser, 2010; Toro et al., 2008). To this end, perceptual mapping of English-to-Korean vowels was extracted from a cross-language perception study which examines Korean speakers' perception of native English vowel production and loanword patterns were drawn from a loanword database in order to quantitatively compare loanword maps with perceptual maps. The overall results showed that perceptual influence on vowel adaptation was significant (R^2=.549), but less than that of consonant adaptation. In order to de-confound other factors which influence loanword adaptation from perceptual influence, data points which represent orthographic influence were excluded first (R^2=.653) and those which represent standardization whereby the Korean government provides prescribed forms were excluded next (R^2=.803). Thus, other factors such as orthography and standardization took on an important role in loanword adaptation as well when perceptual influence was decreased, which diverged from consonant adaptation patterns.

Topics: Cross-language and nonnative perception, Modeling, Vowel perception, Vowel production

Cross-language perception of Italian and Japanese consonant length contrasts: A comparison of Italian and Mandarin-speaking learners of Japanese

Kimiko Tsukada, Macquarie University
John Hajek, The University of Melbourne

Italian and Japanese use consonant length contrastively. In Italian, eco means 'echo' and ecco means 'here (it is)'. In Japanese, yoka and yokka mean 'leisure' and 'fourth day', respectively. This is an area of pronunciation that is known to pose difficulties to non-native learners.

We examined native and non-native perception of Italian and Japanese singleton/geminate by conducting an identification experiment with four groups of participants. The first two groups consisted of L1 Italian (n=14) and L1 Mandarin (n=14) learners of Japanese. All L1 Mandarin learners had passed the highest level of Japanese Language Proficiency Test and were considered more advanced than L1 Italian learners. Crucially, however, only Italian uses consonant length contrastively. The other two groups consisted of L1 Italian (n=14) and L1 Japanese (n=10) listeners who served as controls.

The participants responded to Italian and Japanese (C)VC(C)V(n) tokens produced by native speakers of each language and identified the length category of the intervocalic consonant. The L1 Italian and L1 Japanese groups were at ceiling and more accurate in their L1 than non-native languages. For the Italian stimuli, two Italian groups did not differ from each other (99.5% for both) and were more accurate than the two non-native groups, who did not differ from each other (89.5% for L1 Japanese vs 85.2% for L1 Mandarin). For the Japanese stimuli, the L1 Japanese group (99.4%) was more accurate than the non-native groups. However, the L1 Italian learners of Japanese (96.2%) outperformed the other two groups, who did not differ from each other (88.5% for L1 Italian vs 82.7% for L1 Mandarin).

We tentatively conclude that L1 experience with length contrasts is more helpful than Japanese learning experience for consonant length identification, but that there is additional benefit of Japanese learning for L1 Italian listeners, for whom positive transfer may be assumed.

Topics: Consonant perception, Cross-language and nonnative perception

Poster Presentations 31 August (P2-01 – P2-30)

The Effect of English with a Japanese accent on the Evaluation of Job Applicants

Lisa Nabei, Tokai University

This is an ongoing study which aims to investigate how accented English affects a speaker's employability. The study specifically focuses on the effect of English with a Japanese accent on the attitudes of listeners who are native and nativelike English speakers. Despite the fact that Japanese university students are expected to acquire practical communicative proficiency in English by the time of their graduation, little research attention has been paid to how the English speech produced by such individuals is evaluated when they apply for jobs. The aim of this study is to examine the effect of applicant accents on employment decisions across four jobs that differ in job status and communication demands (manager trainee, underwriter, customer service representative and data entry staff). The study aimed to use a 3 (degree of accent: mild, middle and heavy) $\times 2$ (job status: high vs low) $\times 2$ (communication demands: high vs low) mixed factorial design. So far, eight native and nativelike speakers listened to recorded mock employment interviews varied in the level of accentedness for rating the suitability of each speaker to each job and made a hiring decision about the applicants (At least 20 more participants will have joined the survey by the time of conference). For stimuli, a scripted mock employment interview used by Hosoda and Stone-Romero (2010) was read by several Japanese male university students whose English proficiencies varied. The degree of accentedness of each stimuli was ranked by a professional English teacher based on the construct features of pronunciation such as segments and prosody. The tendency is currently being found that less accented speech is preferred for the job with the higher status and that requires more communication skills. The relationship between the degree of accentedness and its effect on each speaker's employability will be discussed.

Topics: Attitude and identity, Intelligibility and comprehensibility, Psycholinguistics, Sociophonetics

Exploring cognate effects in L2 speakers' consonant production and perception

Susana Cortés, Universitat de les Illes Balears

Juli Cebrian, Universitat Autonoma de Barcelona

Núria Gavaldà, Universitat Autonoma de Barcelona

Celia Gorba, Universitat Autonoma de Barcelona

Angélica Carlet, Universitat Internacional de Catalunya

When bilingual speakers process cognate words, that is, L1 and L2 words that share semantic and phonological information, both the L1 and the L2 lexicons tend to be activated (e.g., Costa, 2006). Further, cognates tend to be less accurately pronounced than non-cognates (e.g., Flege and Munro, 1994; Amengual, 2016). However, studies differ as to the relationship between such "cognate effects" in production and L2 proficiency level (Amengual, 2012; Jacobs et al., 2016). To our knowledge no studies have analysed cognate effects in segmental perception tasks. The goal of this study is thus to examine further the relationship between cognate status and accuracy in production as well as the presence of cognate effects in perception.

A group of L2 English speakers who were second-year university English majors (L1 = Spanish/Catalan) read English words involving aspirated stops and /v/, as well as control L1 words. The L1 has no aspiration and no phoneme /v/. Further, 35 additional L1 Spanish speakers varying in English proficiency and a small group of English native speakers living in Spain performed a perceptual task in which listeners had to determine if two words were equally accurately produced or if one word sounded more native-like than the other. Stimuli consisted of accurate as well as mispronounced words (e.g., unaspirated stops, /b/ for /v/ substitutions). Crucially, half the trials involved cognate words. Preliminary results showed little evidence of cognate effects in production. Possibly the word reading task allowed for more attention to form and more careful production. Regarding perception, the more advanced learners and the native English speakers made fewer errors, but errors were more frequent with cognate words. Results show that cognate effects may be modulated by the type of task and proficiency level. Further research aims to explore less controlled production data and greater differences in proficiency.

Topics: Bilingualism and multilingualism, Consonant perception, Consonant production, Psycholinguistics

The influence of computer-based perceptual phonetic training on the production of word-initial laryngeal contrasts in L2

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The study looked at whether L2 learners' production can benefit from a few short sessions of implicit perceptual training. Implicit training is based on the idea that through simple positive and negative feedback, learners can discover various mechanisms themselves, without receiving explicit theoretical explanations about the rules and patterns being trained. Previous research into the inter-domain transfer of learning suggests that some pronunciation improvement can be observed following the exposure to perceptual training alone (e.g. Bradlow et al. 1997; Hazan et al. 2005; Wong 2015). The research question was derived from the hypothesis that pronunciation inaccuracies in L2 have perceptual grounds and that the two domains are tightly linked (Liberman and Mattingly 1985; Flege 1995).

The participants in the study were Polish learners of English. The experiment compared their perception and production of English word-initial voicing contrasts in plosive stops before and after the exposure to five short sessions of computer-based auditory training paradigm targeting the lenis series /bdg/. The training was aimed at increasing the rates of pre-voicing suppression in L2 English.

In perception, a significant rise in the preference for unvoiced versions of lenis stops was observed. Although the training paradigm targeted the lenis stops, in production, VOT changed significantly only for the fortis series, which shows that aspiration is easier to acquire than pre-voicing is to suppress. However, a slight increase in pre-voicing suppression rates was observed. Nevertheless, the results bear important implications for the ongoing debate about the role of perceptual training in pronunciation teaching since they suggest that the implicit design may not be the best approach to training acoustic details. The study is unique in its focus on the lenis series of plosives – an overwhelming majority of studies looking at L2 learners' perception and production of English word-initial stops focus on the aspirates.

Topics: Bilingualism and multilingualism, Consonant perception, Consonant production, Teaching and assessment, Training

The acoustics of English and Hebrew stops in three groups of bilinguals in Israel

Kyle Jones, University of Arizona

This research investigates the speech of two generations of U.S. olim (immigrants) in Israel, first generation immigrants, whose first language (L1) is American English (AE), and their second-generation children, for whom English is a heritage language (HL). Studies investigating the phenomenon have demonstrated a specific HL accent, showing that heritage speakers have good control of phonetic/phonological contrasts between their two languages but demonstrate distinct patterns from both native speakers (NS) and second language (L2) learners (Chang et al. 2009, 2011; Kupisch et al. 2014).

The following research questions are discussed: What is the speech of HL speakers of AE in Israel like? How does this speech compare to the speech of their parents? How does MH, affect their AE? These questions are investigated through a language questionnaire and a picture naming task targeting voice onset time (VOT) in the AE and MH stops /bdg ptk/, which differ in how phonological voicing/voicelessness is cued phonetically by VOT (AE: short lag vs. long lag; MH: prevoicing vs. voicing lag).

Seven AE HS; ten American olim; and five MH NS participated. Acoustic analysis demonstrates that HL speakers have excellent control over phonetic/phonological contrasts in salient distinctions between their two languages, despite greater variability. These results agree with Flege (1995)'s Speech Learning Model (SLM), which predicts that the younger the age of acquisition, the better phonetic discernment between the two languages will be, resulting in the formation of distinct phonetic categories for both languages. The olim show some L2 (MH) influence on the L1 (AE): Voiced stops, even in AE, tend to be produced as prevoiced, rather than short lag, a shift phenomenon that has been documented for other languages (Pavlenko 2000). Language questionnaires taken by olim suggest this L2 influence is the result of extensive L2 use and cultural identification with Israeli Jews.

Topics: Bilingualism and multilingualism, Consonant production

First and second language speech development: A longitudinal investigation into Arnold Schwarzenegger's segmental speech production in English and German

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Ineke Mennen, Karl-Franzens-University Graz, Department of English Studies

Arnold Schwarzenegger (AS), born in Austria in 1947, moved to the U.S. at the age of 21 where started learning English [1]. AS can be described as a late consecutive bilingual who acquired the second language (L2; English) in adulthood when his first language (L1; Austrian German) had already been fully developed.

The present study is part of a larger investigation which aims at examining AS's L1 and L2 segmental speech production over a period of 40 years, i.e. from the late 1970s up to the 2010s. For this purpose, speech data were taken from different broadcasted interviews with AS which were conducted either in Austrian German (AG) or American English (AE). This investigation presents results of AS's realization of voice onset time (VOT) contrast in word-initial plosives in his L1 and L2. While English distinguishes between short-lag and long-lag VOT [2] [3], speakers of AG varieties tend to neutralize VOT contrast in word-initial bilabial and alveolar plosives in conversational speech [4] [5]. Based on these cross-linguistic differences between AG and English, the aim was to determine if and to what extent AS's production of plosives in his L1 and L2 has changed when comparing early (1970s/80s) and late (2010s) speech samples, i.e. if L2 VOT production has become more native-like, and if the realization of VOT contrast in his current L1 speech has changed compared to early samples. Results indicate that AS realizes a VOT contrast in his early and late L2 which is unlike the typical production in his L1. Findings also show changes in his L1: While he neutralizes VOT contrast in his early speech, he produces a significant contrast for alveolar stops in his late speech, which suggests L2-influnce on L1 production. Results will be interpreted in light of theories on L2 acquisition and L1 attrition.

Topics: Bilingualism and multilingualism, Consonant production

Presentation Session: P2-06

The effects of sampling distribution on incidental learning of lexical tones by bilinguals

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Previous research showed that compared to single-speaker stimuli and cue-manipulated synthesized stimuli input, multi-talker stimuli had an advantage in improving lexical tone categorization in both corrective-feedback and incidental-learning environment. Participants in previous studies were mostly native English speakers who were either L2 Chinese learners or naïve listeners of tone languages. Studies of how sampling distribution influences lexical tone categorization in incidental learning by bilinguals are limited. The current study replicated Liu et al. (2016) to examine how Portuguese-Cantonese bilinguals acquired Mandarin four lexical tones in a video game. Except for Cantonese, these participants had no knowledge of other tone languages. In the game, participants needed to feed four types of food to four animals, each of which was associated with a lexical tone. Participants were not informed of the nature of these sound categories, nor of their significance in the game task. But a faster identification of animals using the tone information benefited the players to achieve higher game levels. The stimuli in the game consisted of tone tokens with both multi-talker stimuli (probabilistic-distribution) that were overlapped among tone categories and variance-manipulated stimuli (deterministic-distribution) that had no overlap among tone categories in terms of pitch height and pitch direction. Sixteen participants were exposed to the two sampling distributions respectively. Results showed that in contrast with the learning outcome of native English speakers in previous study, Portuguese-Cantonese bilinguals in the variance-manipulated condition generalized tone identification to new-talker stimuli better than those in multi-talker condition did. Moreover, the bilinguals in the variance-manipulated condition had a more nativelike cue-weighting in perception of Mandarin tones, and a higher production accuracy rate. The results are discussed in the dual-learning system framework (Maddox & Chandrasekaran, 2014; Roark & Holt, 2018) that the effect of sampling distribution on lexical tone categorization may be language-specific.

Topics: Bilingualism and multilingualism, Cross-language and nonnative perception, Lexical tones, Training

Perception and production of Mandarin tones by native speakers of Japanese

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Reiko Akahane-Yamada, Advanced Telecommunications Research Institute International (ATR); Kobe University

Non-native speakers of Mandarin sometimes confuse Mandarin tones both in perception and production. This study investigated the confusion between Mandarin four tones by native speakers of Japanese who had no experience learning Mandarin. Thirty native speakers of Japanese participated in the perception identification test of monosyllabic words contrasted in four tones, and their productions of those words were evaluated by native speakers of Mandarin. The results showed that the perception accuracies for tone1 to tone4 were 73.1%, 53.9%, 86.4%, 64.1%, respectively. Intelligibility of production for tone1 to tone4 were 96.3%, 87.0%, 78.0%, 98.8%, respectively. It was revealed that tone3 was easiest in perception but most difficult in production. In contrast, tone1 and tone4 were rather difficult in perception but highly accurate in production. Besides, the most confusing tone pair in perception were tone1 and tone2, tones2 and tone4. However, the most confusing tone pair in production was tone2 and tone3. The evaluators judged tone3 produced by native speakers of Japanese as tone2 mostly. These results demonstrated the existence of the tone which was easy to perceive but difficult to the product or the opposite pattern, and the tone confusion patterns were not completely the same in perception and production.

Topics: Cross-language and nonnative perception, Lexical tones

The Effects of Modified Input on the Perception of a Nonnative Vowel Contrast by Adult Chinese Learners of English

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This study investigates whether modified input improves Chinese EFL learners' vowel perception of an English tense/lax contrast ([i]/[ɪ]). Ylinen et al., (2010) found that training (with altered durational contrasts) improved learners' L2 [i]/[ɪ] perception. Our study provided the learners with exposure to modified stimuli in which the vowel duration was manipulated to be highly variable.

According to some recent studies, the high variability phonetic training (HVPT) method using modified acoustic stimuli that helps L2 learners to acquire nonnative vowel contrasts (e.g., Rato, 2014; Giannakopoulou & Ylinen, 2013). Our findings indicate that an HVPT durational input paradigm enhances identification accuracy of the English /i/ and /ɪ/ vowels.

56 native Chinese-speaking adults, equally divided into an experimental and a control group, were taught the /i/-/ɪ/ contrast in six 15-minute classroom training sessions including an ABX discrimination task. In this task, the experimental group trained using natural plus synthesized stimuli whose vowel lengths had been systematically altered. The vowels were: (a) naturally occurring, (b) lengthened (by a factor of two), or (c) shortened (by half). The control group trained using natural stimuli only.

Using a baseline pre-test identification task, an identical post-test identification task determined if the exposure to high-variability vowel duration affected identification accuracy.

Our hypothesis was that the extended duration of the lax vowel would make the spectral contrast more salient to the listener, and hence more easily identified. An ANCOVA was conducted on the two groups. With the covariate of the pre-test scores taken into account, there was a significant difference ($p= .003$; $\eta p2 = .159$) indicating that the experimental group improved significantly (large effect size) more than the control group. We conclude that improved spectral accuracy of the experimental group was caused by the temporal variation in the input. We will also discuss the pedagogic implications of these results.

Topics: Cross-language and nonnative perception, Training, Vowel perception

Understanding Learnability of L2 English and L2 Russian Vowels through the Subset Theory

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While there are several models of speech learnability (e.g., Best, 1993, 1995; Flege, 1995), none describe what happens to the articulatory qualities of vowels in the L2 speech. Moreover, there is a lack of research addressing the Subset theory (Manzini & Wexler, 1987) in relation to phonological acquisition. According to this theory, when two languages compete in the mind of an L2 learner, one language is generally a subset of the other, and the presence of certain parameters in the L1, but their absence in the L2, prohibits their acquisition. To test this prediction, our study compares two languages, English, functioning as the superset [more parameters] and Russian, functioning as the subset [fewer parameters], where we regard parameters as the number of phonemes in each language's sound inventory. This research examines whether L1 Russian-L2 English and L1 English-L2 Russian speakers prioritize subset or superset parameters and how their selection affects their production of L2 vowels. Assuming language is learned on the basis of positive evidence, moving from the parameters of the superset to the parameters of the subset is more difficult. We hypothesize that it is more difficult for L1 English speakers to acquire certain phonological categories when learning L2 Russian, demonstrating difficulty to constrain categories firmly established in the L1. Likewise, it is easier for L1 Russian speakers to acquire new vowel contrasts that do not exist in their L1. Additionally, this study focuses on acoustic analysis of vowels by measuring formant dynamics (Boersma & Weenink, 2018; Themistocleous, 2017), and vowel space area (Sapir et al., 2010), to characterize L2 vowel qualities and to assess how these develop during L2 acquisition. By focusing on the acoustics of vowel production, this work builds on our understanding of the quantitative differences in speech between speakers of languages with diverging vowel inventories.

Topics: Bilingualism and multilingualism, Intelligibility and comprehensibility, Vowel production

On the pragmatic meaning of utterance-level declination in two post-L1 languages

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Bård Uri Jensen, Inland Norway University of Applied Sciences
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In this paper, we are concerned with how multilingual speakers use intonational cues to convey pragmatic meaning in a monolingual mode in their different languages. The data we examine are spontaneous speech in French and Norwegian produced by migrants from the Democratic Republic of Congo living in Norway. Both languages are learned after several other languages, most of which belonging to the Bantu family (Mashi, Taabwa, Lingala, Swahili etc.). Our previous studies have shown that the speakers occasionally produce utterance-level declination (DEF) over declarative utterances in both Norwegian and French, a contour that is not common in L1 Norwegian or European varieties of French, but frequent in Bantu languages. In this study, we investigate the pragmatic meaning of utterances displaying this intonational feature.

In order to establish a corpus of instances of utterance-level declination, we used a two-step procedure. For each utterance, we first picked out F0 contour tops by selecting time points having no higher F0 frequencies within a distance of 200 ms before or after, alternatively within an asymmetrical time slot of 70 ms before and 200 ms after the selected time point. We then picked the utterances based on the criterion that the F0 frequencies of the contour tops were monotonically declining through the entire utterance, with the possible exception of the very first contour top.

The pragmatic analyses show that declination seems to be a marked prosodic feature in the language. We find it used particularly in utterances that mark a contrast with previous utterances, in narrative peaks, and in assessments. In a very general sense, then, it may be considered as a marker of emphasis. More specifically, it serves to highlight information that is new or unexpected and to upgrade the speakers' involvement in utterances with an emotional loading.

Topics: Bilingualism and multilingualism, Intonation, Sociophonetics

Natural Growth Theory of Acquisition (NGTA).

Katarzyna Dziubalska-Kolaczyk, Adam Mickiewicz University

Numerous models attempt to account for bilingual and multilingual acquisition. However, a holistic explanatory framework of the acquisition process in a multilingual mind is still lacking. Here we want to offer a new theory, called the Natural Growth Theory of Acquisition (NGTA). The evidence comes from recent studies on L3 phonology (Wrembel 2015) and phonotactics and morphonotactics (Dressler & Dziubalska-Kołaczyk 2006, Dziubalska-Kołaczyk 2014).

NGTA derives predictions on the basis of linguistic and extralinguistic variables. The former consist of L1, Ln's and universals, the latter include stages and order of acquisition, input and frequency/recency of use, age and age of acquisition, proficiency level, metalinguistic awareness and individual factors.

The CLI studies were conducted on 128 multilingual participants with Polish, English, French and German as L1/L2/L3, and involved accentedness ratings and VOT measures. The results largely corroborate the assumptions and hypotheses of NGTA. For instance, we observed hybrid phonetic values between L1 and L2 irrespective of language type, emergent phonological target values with advancement of proficiency, and universal trends in phonetic grounding of VOT durations in L1, L2 and L3, irrespective of language-specific phonology. These results confirm the relevant NGTA hypothesis.

The (mor)phonotactic studies were conducted on word initial, medial and final clusters in Polish and English, on data from dictionaries, generated paradigms, written corpora, child and second language. We hypothesised that universal phonotactic preferences influence the acquisition of consonant clusters in a second language; the hierarchy of the universal phonotactic preferability will correlate with the level of difficulty in pronouncing L2 lexical clusters; morphonotactic clusters carry morphological information, and their markedness is used to signal their function; and, SL learners will put some effort into the acquisition of morphonotactic clusters, despite their phonotactically dispreferred status. The results are explicable in terms of NGTA.

Topics: Bilingualism and multilingualism, Modeling

Acquiring English stress: weight or position?

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An assumption in second language research is that learners transfer their L1 grammar onto the L2 (Schwartz and Sprouse 1996). Thus, acquiring feature X in the L2 can be more challenging if L1 and L2 do not share X. At the same time, acquiring X can be challenging even when L1 and L2 share X. In the present study, the feature of interest is weight-sensitivity.

Stress is sensitive to syllable weight in numerous languages, including English (Hayes 1982), Mandarin (Qu 2013), and Portuguese (Garcia 2017). In English, however, because word-final stress is avoided in non-verbs, and because most common words in the language are short, stress often falls on the first syllable of the word (Cutler and Carter 1987). This positional bias creates a confounding factor for the learner which may conceal weight-sensitivity.

Because a positional bias in common words can be more robust in the input compared to weight-sensitivity, and because both factors are correlated, the question is whether weight-sensitivity is acquired by learners. Two L1s are examined: Mandarin and Portuguese.

A forced-choice task was designed where participants were auditorily presented trisyllabic English nonce words (n=180) with three different weight profiles: LLL, HLL, LHL (H = heavy syllable). Two versions of each stimulus were recorded: antepenultimate and penultimate stress. Participants were asked which version they considered more natural in English, and how certain they were using a 6-point scale. Learners were Mandarin (n=24) and Portuguese (n=25) speakers ranging from upper-intermediate to proficient in English.

Learners statistically favored antepenultimate stress across all weight profiles (Bayesian logistic models). Participants' reaction times and certainty levels were consistent with the overall results: natives were faster and more certain when choosing a heavy stressed syllable, whereas learners were faster and more certain when favoring antepenultimate (i.e., initial) stress—regardless of weight.

Topics: Bilingualism and multilingualism, Modeling, Stress and accent

Long-term Formants in Bilingual Speaker Identity

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Long-term formants (LTFs) are regarded as a potentially useful feature in examining the identity of a speaker. Previous research studies find LTFs to be largely independent of individual speech sounds and mostly speaker specific (Moos 2008, 2010; Nolan & Grigoras 2005). Some bilingual studies on LTFs report similar results in which LTF means and distributions are consistent across different languages produced by the same speaker, even with vowel inventory differences among the languages observed. Such patterns, however, may not be replicated in all language interactions. In fact, language effects have been observed in bilingual studies on long-term average spectra (LTAS). For example, differences in the 1000 Hz region distinguish Dutch and French. Such differences between the languages were attributed to nasal vowels that exist in French but not in Dutch. Language effects in the spectral energy may also be found in formant data if French nasal vowels yield lower F2 peaks than languages that lack nasalized vowels (or have less frequent occurrence of nasalized vowels, e.g., only existing before nasal consonants). This study therefore compares the LTFs of bilingual speakers of Canadian English and French to investigate whether the existence of nasal vowels in French produce F2 differences within the same speaker. This study will assess the consistency of LTFs in bilingual speech production. Different speech styles will also be examined given that some studies on bilingual LTFs find considerable individual variation in formant values as a function of speech style.

Topics: Bilingualism and multilingualism, Sociophonetics, Vowel production

Dynamic changes in Spanish-Basque bilingual production as a function of intensive L3-English use: A longitudinal study

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Previous research has shown that L2-learning in immersion results in an assimilatory drift in native production toward L2 phonetic norms (Chang, 2012, 2013), unless L2 speakers use frequently their native language (L1) in L2-speaking country (Tobin, Nam, & Fowler, 2017), suggesting that L1 use might prevent L2 influence on L1. The current study examined short- and long-term effects of foreign-language training on vowel production in the two native languages of simultaneous Spanish-Basque bilingual adolescents enrolled into a two-week Erasmus study abroad (SA) English program. In particular, it assessed the role of frequency of native language(s) use and switches on the amount of changes in both Spanish and Basque.

Ten bilingual speakers read five Spanish and Basque CVCV words two months before their SA, the next day and four months after their arrival back to Spain. Each word contained one of the five vowels in the stressed syllable and was repeated five times. Mixed-effect regression analyses were performed on vowel F1 and F2.

Our results revealed assimilatory drift in F1 toward the English vowel system in bilinguals' both native languages, the next day after the SA program. However, four months later, bilinguals showed a 'recovery' drift toward their native norms, suggesting that intensive (native) language use and exposure induced adaptation to ambient speech. The size of the drift varied as a function of usage frequency and switching habits. In balanced bilinguals, the effects of L3-English use were similar for both languages, whereas in Spanish dominant bilinguals, they were observed in Basque only, suggesting that irregular L1 use made this language more vulnerable to foreign-language influence. The frequency of language switches had a 'protective' role: more switches were associated with less pronounced drift in both native languages, suggesting that switches allow to maintain the phonetic targets through a regular contact between languages.

Topics: Bilingualism and multilingualism, Training, Vowel production

Correcting versus misunderstanding L2 pronunciation: evidence from English-French tandem conversations

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Determining which non-native pronunciations are more salient than others has been a recurrent theme in SLA research. Two important indicators in this context are the intelligibility of learner speech and the focus of listeners' remedial reaction to that speech. Our aim is to identify the types of errors that are highlighted by our empirical studies on our bilingual English-French SITAF tandem corpus in both domains.

Research questions:

(1) What is the relative share of pronunciation issues in the overall CF (corrective feedback) mass, compared to their contribution to generating communication breakdowns?

(2) Which specific problems stand out in each analysis?

(3) Do the English and the French data present similar pictures?

General results: (1) Greater role played by pronunciation problems in impeding intelligibility than in inviting CF: in English, 36% of cases where NNS speech was misunderstood appear to be due to phonetics, whereas only 20% of CF instances target pronunciation. In French, the respective figures are 33% and 16%. The above statistics – though not directly comparable – suggest that L2 phonetics affects NS-NNS communication more than may generally be believed. (2) In English, incorrect lexical stress is the key factor in rendering words unrecognisable to the native listener (pri'soner, pe'nalty). However, only 1/3 of all pronunciation CF in English concerns stress or other suprasegmental matters. Those are virtually absent from CF in French, where the NSs target mostly missing rounded vs. unrounded vowel contrasts ('pull' vs. 'poule'), consonant elision, consonant epenthesis ('longtemPs') and lack of liaison. The last two issues hardly ever seem to generate misunderstandings. (3) In addition to the above, there are sharp differences in the number of occurrences of CF (twice more in French) and misunderstandings (25% more in English).

The results may have implications for further discussion of pedagogical priorities for L2 pronunciation instruction.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception, Intelligibility and comprehensibility, Stress and accent, Teaching and assessment, Vowel perception

Perception and production of French (L3) phonemes and the Verbo-Tonal Method's potential in French class in Denmark

Pernille Berg Johnsson, University of Uppsala (ph.d. student)

Questioning the articulatory preference in French teaching in Denmark, this master thesis has (1) studied the perception and production of French phonemes by Danish-speaking learners of French (L3) and (2) applied the Verbo-Tonal Method (VTM) (Guberina 1965) in order to evaluate its potential for the first time in a Danish context. On the basis of SLA theories (Lado 1957, Krashen 1983, Flege 1995) and a contrastive analysis of the Danish and French phoneme inventories, we formulated the hypothesis that in French phonetics in Denmark one needs to focus on /z/, /ʒ/, /ʃ/, /ɥ/ and the nasal vowels /ɑ̃/ and /ɔ̃/ (i.e. 'new' sounds), /p, t, k/, /b, d, g/, /v/ and /s/ (i.e. 'similar' sounds) as well as /ʁ/ in foreign positions, before testing each target sound in a repetition task and a reading aloud task. Our participants were twelve Danish-speaking learners of French (age: 15-18, level A1, A2 and B2) from Copenhagen. By analysing their phonetic accuracy in 768 (re)productions (32 words/16 minimal pairs), we concluded that teachers should give priority to the voiced fricatives /z/, /ʒ/ and /v/ when it precedes [w] and the liquid /ʁ/ in foreign positions. When comparing the participants' reproductions and productions, we observed that only those participants who perceived the sound in question ([ʒ] [ɥ] [vw]) produced it correctly. This accords with the main principle of the VTM that seeks to re-educate the learner's auditory perception in order to improve pronunciation. Aiming to determine the VTM's most advantageous correction procedures, we applied the method ourselves on errors observed in the first tests. Changes in prosody accompanied by gestures proved to be the most beneficial when correcting segmental errors, followed by nuanced pronunciation and facilitating surroundings. Given the participants' general response to the VTM, we encourage further studies on the effects of audio-visual training.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception, Training, Vowel perception, Vowel production

Hand-clapping to the rhythm of newly learned words improves L2 pronunciation: Evidence from Catalan and Chinese learners of French

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There is growing evidence that rhythmic training is beneficial for first language development (e.g., speech segmentation, phonological skills, memorization, etc.). Studies by Cason and collaborators have shown that speech processing is enhanced by musical rhythmic primes. However, studies on rhythmic training for second language acquisition are scarce. To our knowledge, only three studies from different domains of research have investigated the effects of rhythmic training on L2 pronunciation (Fischler, 2009; Wang, Mok, & Meng, 2016; Gluhareva & Prieto, 2017), none of which would be easily applicable to teaching suprasegmental aspects of pronunciation in the classroom. Surprisingly, the possible facilitating effect of hand-clapping to the rhythm of the target L2 prosody hasn't been fully investigated. The aim of this study is to assess whether a short training session improves L2 pronunciation through hand-clapping to the rhythm of newly learned French words. Our hypothesis is that clapping can facilitate the general pronunciation and syllable duration patterns.

In two between-subject experiments with a pre- and posttest design, thirty Catalan children and fifty Chinese adolescents were trained with either repeating words aloud while clapping along with their rhythmic structure or simply repeating the words orally. The participants also undertook a set of cognitive, linguistic, and musical control measures. Participants' oral productions before and after training were rated for accentedness by three native French speakers. Results showed a significant improvement for the clapping group among the Catalan children, whereas only a near significant tendency was shown for the Chinese participants. Looking towards the control measures, it was found that working memory influenced Chinese participants' accentedness ratings. Later acoustic analyses demonstrated that the experimental group improved significantly in final-vowel duration. To conclude, the results show that short phonological training session based on highlighting the rhythmic structure of words helps improve foreign language pronunciation.

Topics: Consonant perception, Consonant production, Intelligibility and comprehensibility, Rhythm, Teaching and assessment, Training, Vowel perception, Vowel production

Effects of Prompts and Individual Corrective Feedback on L2 Pronunciation in the Online Exam-oriented Context in China

Jingxuan Tian, The Education University of Hong Kong

This study aimed to investigate the effects of two types of corrective feedback, prompts and revised individual corrective feedback, on L2 pronunciation in the exam-oriented context in China. Prompts and individual corrective feedback have been proved to be effective in second language teaching and learning (Dlaska & Krekeler, 2013; Gooch, Saito, & Lyster, 2016). 'Which type is suitable and effective in the online exam-oriented context in China' is the research question of this study. The participants were 30 Chinese International English Language Testing System (IELTS) candidates who got 5-5.5 in previous IELTS speaking test and would retake the test. They were divided into 3 groups (prompts, revised individual corrective feedback, and instruction-only). Participants took a pre-test which is to read aloud a passage 'The Boy Who Cried Wolf' (Appendix 1.) before being enrolled and grouped in which mispronounced sounds which were the teaching contents were decoded. Each group received a 4-hour online IPA instruction after the test by the same instructor who received Cambridge English Level 5 Certificate in Teaching English to Speakers of Other Language (CELTA). Participants in the prompts and revised individual feedback groups practiced and received feedback from the instructor in and off the class while those in the individual corrective feedback group also received feedback from the peers. An immediate post-test which contains two parts (reading aloud test which shares the same content with the pre-test and a topic description task) was conducted after the instruction. A delayed post-test was conducted a month later after the instruction. The results revealed that participants in the revised individual corrective feedback group performed better in the post-tests, while participants in the other two groups had no big difference in the immediate post-test and participants in the prompts group had better performance than the instruction-only group in the delayed post-test.

Topics: Consonant production, Training, Vowel production

The Effect of Familiarity and Neighbourhood on L2 Speech Perception: A Comparative Study of
English Learners and Japanese Learners

Erina Sawada, Sophia University

Studies on spoken word recognition have investigated lexical effects in relation to properties of words such as frequency, familiarity, and neighbourhood. Although previous studies revealed the effects on L1, lexical effects on L2 spoken word recognition are still largely unexplored.

The present study tackles this unexplored area and proposes another aspect of lexical effects on learners. Japanese learners of English (EFL), English speaking learners of Japanese (JFL), novice JFL (never studied Japanese), and Japanese natives were recruited for a perception experiment. They were asked to memorize the target words auditorily and proceeded to a retrieval task to judge whether each stimulus was one of the target words. The targets and fillers were extracted from audio-familiarity databases, having either high- or low-familiarity, with either high- or low-familiarity neighbourhoods, comprising four different neighbourhood types.

The reaction time results showed that learners also exhibited a facilitative familiarity effect across languages and their proficiency, following previous studies on L1. However, EFL and JFL performed differently according to the neighbourhood types. In high-familiarity word conditions, EFL responded faster on both high- and low-familiarity neighbourhoods; whereas JFL only responded faster on low-familiarity neighbourhoods. A facilitative neighbourhood effect in Vitevitch and Rodriguez (2005) was consistent only with EFL. In addition to reaction time analysis, there was a significant positive correlation between d-prime scores and proficiency levels both within EFL and JFL. Interestingly, both advanced and novice JFL performed faster and more accurately than intermediate learners despite that novice JFL was supposed to have no lexicon of Japanese yet.

The new insights in the present study are: (1) learners primarily process high-familiarity words, (2) neighbourhood types and proficiency interact in a variety of ways, and, notably, under-developed L2 lexicon in intermediate learners may impose an inhibitory effect in word recognition, and (3) sensitivity progresses along with proficiency levels.

Topics: Cross-language and nonnative perception, Psycholinguistics

Decomposition of Error Annotation Task: The role of relational complexity

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Phonetic annotation of non-native speech corpus is important for the study on L2 phonology. However, it is usually complex and time-consuming. This study proposes to adopt the theory of Rational Complexity (RC) in psychology field to explain the reason of annotation difficulty, and to optimize the annotation process by decomposing a high-level complexity task into a combination of a few low-level sub-tasks.

RC refers to the arity of relations, which is the number of interacting variables that constrain decisions (e.g., ternary relations have three variables as in addition: 2, 3, 5). A traditional error annotation task, usually requires annotators to label where and what the errors are in the utterances simultaneously within one task. According to RC theory, it entails processing quaternary relation linking four variables (utterance, phoneme, prototype, notation) which leads to the complexity and difficulty of the task. To reduce the complexity, this study broke it into two ternary relations steps: (1) Identifying errors (utterances, phonemes, prototypes); (2) Describing errors (phonemes, prototypes, notation). To explore impacts from decomposition, we tested it:

A total of 32 annotators participated in the comparison experiments on a test set of 27 utterances, with 16 as the test group, and the other 16 as the control one. Group 1 did task A. The primary tasks of the two groups were same, but the only difference were between methods: control group used the traditional way; test group used the decomposition way. The results showed that the test group not only used less time than the control one but also achieved higher annotation accuracy.

Thus we suggest that the proposal be effective, and RC theory can be a direction to further optimize data annotation task.

Topics: Cross-language and nonnative perception, Psycholinguistics, Teaching and assessment

The relationship between the perception and explicit knowledge of the "can't" variation

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The auxiliary verb "can" and its negative form "can't" are frequently used in English conversation. However, depending on the phonetic/phonological context and the variety of English, the contrast can be difficult to discriminate for nonnative listeners.

The goal of our research is to improve the public education of second/foreign language (L2) pronunciation in Japan. Although the North-American-type pronunciation of "can't" is dealt with in the authorized English textbooks of junior high school in Japan, these textbooks do not deal with the British-type pronunciation (Ooigawa, 2018), which suggests the limitation of the explicit knowledge of English pronunciation variation in Japanese public education.

The present study examines how explicit knowledge of L2 pronunciation affects L2 perception. A forced-choice identification test of "can" and "can't" of both North-American-type and British-type English was carried out. The test compared two listener groups (N = 27 and 29): Japanese learners of English who know the difference in the pronunciation of "can't" between American and British English and Japanese learners of English who do not know the difference. The stimuli included both sentence-medial and sentence-final "can" and "can't," and the stimuli of "can" consisted of both weak and strong forms.

The results indicate that the listeners with the explicit knowledge showed better identification performance of the North-American-type and British-type "can't" stimuli in sentence-medial position than the listeners without the knowledge. Meanwhile, no significant difference in the overall "can" and "can't" identification of both types of English was found between the groups.

Therefore, we cannot conclude that only explicit knowledge of L2 pronunciation results in better L2 perception. Furthermore, we cannot indicate that it is important to explicitly teach L2 pronunciation of wide varieties. L2 learners may need not only the explicit knowledge but also the listening training or/and actual experience in order to acquire better L2 perception.

Topics: Cross-language and nonnative perception, Teaching and assessment

Effects of pronunciation training on connected speech in English for Japanese university students

Tomomi Otsuka, Osaka Jogakuin College

Since the importance of teaching suprasegmentals for pronunciation has been established (Munro & Derwing, 2015), instructors have been searching for more effective ways to teach them. Among suprasegmentals, connected speech has been one of the obstacles to listen to English sounds. The purpose of this study is to see what effect pronunciation training has on Japanese learners' perception of connected speech.

Focusing on linking, elision, and assimilation, 79 Japanese university students participated in an three-hour training in class. Students were divided into two groups: one focusing on self-monitoring with recorded their own voice, and the other focusing on just listen-and-repeat practice without recording. Pre- and post-tests were computer-based fill-in-the-blank tests, and measured the perception of connected words. Since the in-class setting possibly includes many effects from other classes, another training was also conducted in the more restricted setting in the lab where 13 students participated in it for six hours.

A two-way ANOVAs were conducted for each category (linking, elision, or assimilation), where the phases (pre- and post-tests) and treatments (only repetition, or both repetition and reflection) were variables. Results of in-class setting showed statistically significant improvement for the perception of linking and elision in both treatments, but not for assimilation. However, the differences between the treatments were non-significant in all three categories. Results of the lab training shows statistically significant improvement in the perception of linking in both treatments. Moreover, the significant difference in assimilation was shown between the treatments.

These results showed that the training helped perception of linking in class and lab setting, but we did not find significant differences between treatments. In order to determine the effect of training, the improvement in pronunciation performance should be also investigated.

Topics: Cross-language and nonnative perception, Training

Enhanced English Accentedness and Comprehensibility: Use of Modified Input in Teaching English Lexical Stress

Keun Kim, University of Victoria

Past studies on L2 pronunciation have reported that suprasegmental errors such as stress and intonation are as much or more responsible for accentedness and comprehensibility ratings than are segmentals (Derwing & Munro, 1995; Kang, Rubin, & Pickering, 2010).

English stress can be challenging for Korean speakers to acquire due to the different prosodic systems of the two languages. While English has stress accent at the lexical level, Korean has a stress pattern at the phrasal level known as the accentual phrase (Jun 1996).

In this paper, I will report on a study investigating 30 L1 Korean subjects to examine the efficacy of providing lexical stress diacritics on written sentences on the accentedness and comprehensibility of their L2 English. In TEST 1, participants read aloud 15 English sentences without diacritics (e.g., I have announced a recall of the computers.). Then, they were given a 10-minute training session where novel sentences written with diacritics to mark stress placement were read aloud (e.g., I love Victória). The subjects were given explicit instruction on the production of increased pitch and extended duration as a marker of English stress.

In Test 2 (immediately following the training), the participants read the same sentences from TEST 1 but with diacritics included (e.g.,I have annóunced a récall of the compúters).

In Test 3, which took place two days after the TEST 1 and TEST 2, participants read 15 sentences without diacritics again to see if the effects of the training are retained.

Speech samples from three TESTs were rated by three native speakers of English in terms of comprehensibility and accentedness. The findings indicate significant improvement in TEST 1 (without diacritics) vs. TEST3 (without diacritics) and TEST 1 (without diacritics) vs. TEST 2 (with diacritics) in both accentedness and comprehensibility ratings, showing promise as a pedagogic technique.

Topics: Intelligibility and comprehensibility, Stress and accent, Teaching and assessment, Training

Presentation Session:　P2-24

Pronunciation training with repeating musical rhythm: Its effect on Japanese learners of English when learning the segmental and suprasegmental sounds

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Rhythm plays an important role in language processing and production. When hearing a metrical sequence, listeners can predict how to follow a rhythmic pattern. This expectation allows listeners to rhythmically allocate attentional resources to speech processing, which can ease perception (Cason & Schön, 2012) or production (Cason, Astésano, & Schön 2015). Regarding second languages (L2), little is known about the beneficial effects of rhythm on phonological learning. Several studies have demonstrated that rhythmic training can help enhance L2 pronunciation (e.g., Zhang, Ballis, & Prieto, 2018; Gluhareva & Prieto, 2016). Nonetheless, these studies involved factors supplementary to rhythm, such as hand-clapping or gestures, which might have veiled the independent role of rhythm. Moreover, the previous studies focused on suprasegmental features. However, if rhythmic training reduces the cognitive demand for learning rhythm, it may also allow learners to focus and enhance other sounds.

The aim of the present study is to examine whether rhythmic training with English sentences improves the L2 pronunciation (pitch range, rhythm: duration ratio of unstressed to stressed vowels, vowels) of Japanese learners of English. In an experiment with a pre- and post-test design, 20 participants either repeated 16 short sentences (non-rhythmic training) or repeated musical rhythms (beats composed of snare and shaker sounds that matched the sentences rhythmic structures) using the sound, "ta", followed by repeating the sentences (rhythmic training). Each sentence was randomly repeated three times. The participants' oral production was elicited using immediate repetition in the pre- and post-tests. Next, it was analyzed acoustically. The results showed that the rhythmic training group significantly improved their suprasegmental sounds and also tended to improve their segmental sounds. These findings suggest that musical rhythm repetition can help enhance the L2 pronunciation of sounds other than rhythm.

Topics: Psycholinguistics, Rhythm, Training

Phonetic norm in French L2 textbooks and its effect on L2 learners' speech competence - the case of
French liaison

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This study examines the French phonetic norm found in textbooks, especially the French linking phenomena, i.e. liaison. Bybee (2001) defined liaison as "the appearance of a word-final consonant before a vowel-initial word in words that in other contexts end in a vowel". Its realization and non-realization is influenced by numerous factors. There are also three kinds of liaison contexts: categorical, variable, and erratic (Durand & Lyche, 2008). Especially in the case of variable liaison, its realization is conditioned by a range of linguistic and extralinguistic constraints. This type of liaison is more frequent during a formal style, and less during an informal style. For L2 learners, the categorical liaison poses less difficulty, but use of the variable liaison is difficult enough even for advanced learners (Howard, 2004; Tennant, 2016). Moreover, Howard (2004) indicated significantly lower usage of variable liaisons compared to native speakers.

The present study aims at exploring the pedagogical norm for variable liaison in our L2 French textbooks corpus (about 50,0000 words with audio CD) and investigating which type of variable contexts learners encounter most often during their use of textbooks. Based on quantitative analysis, our study considers the frequency of liaison realization in variable contexts. We also compare our textbooks corpus with another corpus of Japanese learners' French conversations to examine the effect of textbooks on the acquisition of variable liaison. The results indicate that a higher rate of liaison realization is observed in certain contexts (ex. Monosyllabic auxiliary +, Noun + Adjective, etc⋯) in the textbook corpus. Learners can more easily acquire the use of liaisons in such contexts compared to other contexts for which the rate of liaison realization is lower.

Topics: Sociophonetics

Spelling-pronunciation and phonetically challenging words in one-year progress testing: qualitative analysis

Marta Nowacka, University of Rzeszów

The aim of this paper is a qualitative analysis of students' pronunciation of 95 items after one-year instruction, to obtain the range of transcribed renditions and verify spelling-pronunciations.

Spelling - a valuable resource that positively affects learners' oral accuracy and fluency - should be an integral part of a phonetic course (Carney, 1994; Wells, 2008; Upward and Davidson, 2011; Crystal, 2012; Boyer, 2013; Brooks, 2015; Dickerson, 2015). Despite that, recent research shows that spelling-induced pronunciation errors and whole words with deceptive spelling have a negative effect on intelligibility and comprehensibility (Szpyra-Kozłowska 2013, 2015; Porzuczek, 2015; Bryła-Cruz, 2016; Nowacka, 2016).

A word- and sentence-reading diagnostic test was administered to 91 first-year students twice. The 87 selected lexemes targeted: letter and sound correspondence, stress placement, suffix –ate, contractions, weak/strong forms and phonetically challenging content words. The 60-hour pronunciation training, apart from a focus on segments and suprasegments, included relationships between spelling and pronunciation, e.g. most typical letter-to-sound correspondences (Wells, 2008), as well as a summary of spelling guidelines (Collin and Mees, 2008) and words commonly mispronounced (Sobkowiak, 1996).

As regards the method, in the quantitative examination the Wilcoxon signed-rank test - $p < \alpha$ (p=0.00000) and the Cochran Q test were applied. The items that are still mispronounced by the majority of the respondents despite the training are as follows: 20 phonetically challenging words; 4 contracted forms: 'don't' (14% correct), 'won't' (26%), 'mustn't' (36%) and 'you're' (49%); 2 weak forms: 'has' (25%) and 'of' (35%); an early lexical stress ('characterize' - 13%), and a suffix '– ate' ('certificate' - 45%).

A practical implication is the recommendation of productive spelling-to-pronunciation rules, e.g. letter <o> represents GOAT ('folk' - 46%), STRUT ('oven' - 47%), as well as silent /b/ in 'limbs' - 35%, etc., and an indication of orthographically non-transparent words for memorization, which should be useful for future English specialists.

Topics: Teaching and assessment, Training

Effects of feedback, exposure and awareness-raising on L2 sound contrast learning

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This study investigates how (1) awareness of the difficulty of an L2 contrast, (2) exposure to native pronunciation and (3) negative feedback affect L2 sound acquisition. It studies Dutch learners' production of English /æ/ and /ɛ/, which are contrasted in height and frontness, using an interaction stage preceded and followed by a sentence-completion task containing these sounds. Unbeknownst to the participants, only pre-recorded speech was used, by using the Ventriloquist Paradigm (Felker et al., 2018, JASA), which allows for complete control over the acoustic characteristics and amount of input participants receive, while making participants believe they have a real, spontaneous conversation.

Participants were 49 Dutch native speakers with intermediate proficiency in English. During the interaction phase, they played a cooperative game, face to face with a Ventriloquist confederate, designed to raise their awareness of the difficulty of the critical contrast by making them pronounce words containing /æ/ (bad) different from the /ɛ/ minimal pair counterpart (bed). Presence or absence of negative feedback on the participants' pronunciation and of exposure to the native speaker's production of these vowels were fully crossed, resulting in four conditions.

F1 and F2 analyses of /æ/ and /ɛ/ in the pre-test showed that participants distinguished the two in height but not in frontness; therefore formants were analyzed independently. Results showed that awareness-raising of the difficulty of the contrast made participants improve both height and frontness. Exposure to the native pronunciation improved the dimension they did not master, frontness. Negative feedback did not improve their pronunciation and even hindered learning when combined with exposure. This study thus shows that awareness raising, exposure, and negative feedback affected F1 and F2 of the same vowel contrast differentially. It also confirms that methodologies combining fine-grained control and spontaneous interaction can help give insights into the mechanisms underlying L2 sound acquisition.

Topics: Teaching and assessment, Training, Vowel production

Mirroring Effects on Duration of EFL Learners

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The mirroring of a speaker of English has been discussed in terms of improvement of fossilized pronunciation of EFL Learners (Acton, 1984). Especially beat gestures could enhance self-regulation (McCafferty, 2006), production and comprehension (Krahmer & Swerts 2007). Previous studies (Tarone & Meyers, 2018) have suggested that the mirroring practice could expand the pitch range of talkers, but it is not known how much that would influence the duration contrast between stressed and unstressed syllables.

In our study, about 30 students of an EFL class (average TOEIC of around 420) at a Japanese university participated in the experiment. The class was divided into an experimental group and a comparison group. The former participated in the mirroring training while the latter the shadowing training for 3 weeks (20 minutes each time). Before the training, both groups received explicit instructions about the pronunciation of unfamiliar words as well as stressed vs. unstressed syllables.

The duration of stressed and unstressed syllables of sample sentences were measured with Praat. The normalization method followed Mori, Hori and Erickson (2014). The t-test was done for the posttest duration values of the two groups. A tendency was found in the duration of syllables of a sample sentence between the mirroring group and the shadowing group, suggesting that the mirroring helps learners compress unstressed syllables. Post-questionnaires also showed that more participants in the mirroring group feel able to efficiently perform gestures, eye contact, facial expressions, and emotion during the speech.

The compression of unstressed syllables is crucial to making content words prominent as well as contributing to achieving English rhythmic alternation in sentences. Therefore the outcomes should contribute to the intelligibility of the utterance (Derwing & Munro, 1997) and emotion (Erickson, 2018), which awaits further research.

Topics: Training

A short training with durational hand gestures improves Catalan speakers' pronunciation of Japanese vowel length contrasts

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Previous studies showed that observing or producing pitch gestures (e.g., hand gestures mimicking F0 movements) benefits the learning of novel L2 tonal (e.g., Morett & Chang, 2015) and intonational (e.g., Yuan, González-Fuente, Baills, & Prieto, 2018) contrasts. However, limited effects were found with hand gestures mimicking durational properties of speech (see the work by Hirata and colleagues on the L2 discrimination of Japanese vowel length contrasts). The goal of this study is to further investigate the role of durational hand gestures in phonological learning by taking into account its effects not only on perception but also on production, and by using a homogeneous horizontal hand sweep for the vowel length contrasts, which encodes durational differences without changing the gesture form.

In a between-subject experiment with a pre- and post-test design, 50 Catalan dominant participants without knowledge of Japanese were trained to discriminate and to imitate Japanese sentences containing a set of disyllabic words contrasting only in vowel length. They were randomly assigned to one of two audio-visual conditions, namely the (a) Gesture group (training with hand gestures) and the (b) No-Gesture group (training without hand gestures). Before and after training, they performed a discrimination task (perception) and an imitation task (production). Their speech production was acoustically analysed for the duration of the target vowels.

The results showed that while both groups improved in both tasks after training, the Gesture group yielded larger improvements than the No-Gesture group in perception and production. Two GLMM analyses revealed that there was a significant interaction of Condition*Test for the production, while no such significant interaction was observed for the perception. These results suggest that durational gestures help beginners boost the learning of L2 vowel length contrasts, and that the benefits can be immediately observed in word pronunciation patterns.

Topics: Training, Vowel perception, Vowel production

Distinctions of English Tense-Lax Vowels in Chinese English and Pakistani English

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Previous studies demonstrate much difficulties for non-native English speakers to acquire the distinction between tense and lax vowels in English. The present study explores the distinctions of English tense-lax vowels in Chinese English (CE) and Pakistani English (PE) compare to British RP English (BE). The subjects are 17 CE speakers, 20 PE speakers currently doing their postgraduate degree in a Chinese university, and 2 RP phoneticians from Britain. The target English tense-lax pairs are /iː-ɪ, ʊ-uː, ɒ-ɔː/ imbedded in carrier words read by the subjects. The data were recorded in the phonetic laboratory at the University of Cambridge and Yangzhou University Laboratory of Phonetics, Hearing and Cognitive Science respectively. The results of acoustic analysis reveal that, in terms of duration, unlike native BE speakers, both CE and PE speakers are unable to distinguish tense-lax pairs successfully, and the tense-lax pairs in PE are even significantly shorter than those in CE; and in terms of F1 and F2, there's no huge difference in /iː-ɪ/ pair but significant variations in / ʊ-uː/and /ɒ-ɔː/ pairs between CE/PE and BE. This demonstrates both CE and PE speakers apply different temporal and spectral values to distinguish English tense-lax vowels, which shed light to the unintelligibility of L2 CE and PE in non-native English communication.

Topics: Vowel productio

Oral Presentations 1 September (31A1-31C3)

Explicit and Implicit Auditory Processing Abilities Predict Successful Adult L2 Speech Learning: A Behavioural and Neurophysiological Study

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L2 pronunciation development in adulthood is subject to a great deal of individual variability. While some learners can achieve near-nativelike proficiency, others remain strongly foreign-accented. In the cognitive psychology literature, scholars have investigated links between auditory processing abilities and L1 development and impairment (Bishop & McArthur, 2005). In the current investigation, we examined a novel, interdisciplinary hypothesis that individual differences in these auditory processing abilities can determine the degree and quality of successful late L2 speech learning.

In the context of 60 Polish speakers with diverse immersion experience in UK (1 month to 20 years), different dimensions of their L2 English pronunciation proficiency, elicited via a picture narrative task, were evaluated via rater judgements (Saito et al., 2017 for segmental and prosodic accuracy) and acoustic analyses (Bosker et al., 2013 for articulation rate, frequency and location of pauses). Whereas their explicit auditory processing abilities were measured through psychoacoustic tests (discriminating pairs of non-verbal sounds differing in pitch, formant and duration), their implicit brainstem encoding of the higher-frequency formants and fundamental frequency of speech was measured using an EEG component called the frequency following response (Omote et al., 2017).

Overall, participants likely demonstrated greater L2 suprasegmental proficiency (instrumental to comprehensible and intelligible pronunciation: Kang et al., 2010), when they used the target language in a wider range of social settings for a longer period of time. However, the incidence of highly advanced L2 segmental proficiency (crucial for nativelike pronunciation: Trofimovich & Isaacs, 2012) was tied not only to their experience profiles, but also to their explicit and implicit auditory processing abilities. The findings provide empirical support to the theoretical view that the cognitive underpinnings of language acquisition comprise domain-general auditory processing abilities (Hamrick et al., 2018), and that such perception-based mechanisms govern both L1 and L2 (Diaz et al, 2016).

Topics: Bilingualism and multilingualism, Neurolinguistics

Phonological error and variation in second language speech: a question of mental representation?

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Our study investigates Quebec francophone pronunciation errors in English: th-substitution (think that → tink dat) (Trofimovich & John, 2011); and h-deletion or epenthesis (happy → _appy; ankle → hankle) (Mah, 2011). Can francophones perceive /θ ð/ and /h/? If not, it follows that their mental representations lack these phonemes. In this case: How is it that they are able variably to produce /θ ð/ and /h/?

50 adult francophones and 11 anglophones completed two auditory tasks. The first tested perception of /θ ð/ and /h/ using 450 trials in an oddball paradigm (e.g, think-think-think-tink vs think-think-think-think). Participants indicated whether the final word was the 'same' or 'different'. Brain activity was also monitored via electroencephalogram for Mismatch Negativity, an event-related potential (ERP) triggered by difference detection. The task included easy (fan-pan) and difficult (thank-tank, eat-heat) contrasts to verify perceptual assimilation (Best, 1994), according to which /θ ð/ should be perceived and mentally represented as /td/; /h/ should simply not be detected.

In a second task (150 sentences with easy/difficult substitutions), participants indicated whether the sentence made sense or not. Brain activity was monitored for N400, an ERP triggered by semantic incongruity. The aim was to test our proposal (Authors, 2017) that variation in pronunciation errors (e.g., variable output tank/thank for 'thank') is due to the presence of two lexical representations that compete for selection. According to this hypothesis, participants should have greater difficulty detecting substitutions they themselves make (thin → tin) than those they do not (tie → thigh).

ANOVA results revealed significant differences (p<.0001) in accuracy and ERP amplitude between easy and difficult contrasts for francophones only. However, considerable cross-participant variation is hard to reconcile with perceptual assimilation. Also, contrary to our dual representations proposal, differences between /θ ð/ conditions in the second task were not significant. Alternate explanations will be proposed and discussed.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception, Neurolinguistics

Perceptual restoration: Second language learners' performance in their L2 vs. L1

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Perceptual restoration is a phenomenon where listeners perceptually restore missing or distorted sounds to understand speech. Previous studies suggested that second language learners are generally less competent in language processing than native speakers, but what makes the difference between native and non-native speakers in perceptual restoration of degraded speech? The current study investigates how non-native speakers of English (native Japanese speakers) perceptually restore temporally distorted words and non-words in their second language (English), as compared to native speakers (as reported in Ishida, Samuel, and Arai, 2016; Experiment 1), and as compared to their first language (Japanese) (Experiment 2). Here, the temporal distortion of speech was generated by flipping every local segment of speech signal (every 10, 30, 50, 70, 90, or 110 ms) on the temporal axis (i.e., locally time-reversed speech). In Experiment 1, participants listened to locally time-reversed English words and non-words that contained either many fricatives or many stops. The results suggested that, as with native speakers' results in the previous study, speech became gradually unintelligible as the length of reversed segments increased. In addition, words were significantly more intelligible than non-words. However, contrary to native speakers' performance, the intelligibility of fricative-dominant and stop-dominant lexical items were not significantly different, although fricative-dominant items were better understood. In Experiment 2, participants listened to locally time-reversed Japanese words and non-words that contained either many fricatives or many stops. The results suggested that, as in their second language, speech became gradually unintelligible as the length of reversed segments increased, and words were significantly more intelligible than non-words. However, contrary to second language performance, fricative-dominant lexical items were significantly more intelligible than stop-dominant lexical items. It seems that listeners can take advantage of phonetic-acoustic information in perceptual restoration of locally time-reversed speech in their first language, but not in their second language.

Topics: Cross-language and nonnative perception, Intelligibility and comprehensibility, Neurolinguistics, Psycholinguistics

Presentation Session: 31B1

Effects of perceptual assimilation and vowel peripherality in perceiving non-native vowels

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In the present study, the predictions made by the theoretical frameworks of Perceptual Assimilation Model (PAM; Best, 1994, 1995) and Natural Referent Vowel (NRV; Polka & Bohn, 2003, 2011) were examined for Japanese speakers perceiving English /æ/, /ʌ/, and /ɑ/. According to PAM (Best, 1994, 1995), discriminating two non-native phonemes that are equally good or poor exemplars of a single native phoneme is more difficult than discriminating two non-native phonemes that differ in goodness of fit to a single native phoneme. An identification test with a goodness rating task for a vowel stimulus continuum varying in F2 was given to 30 Japanese and 26 English speakers. Based on the results, three stimuli which were identified as English /æ/, /ʌ/, and /ɑ/ by English speakers but identified as a single Japanese /a/ by Japanese speakers were selected and used for a discrimination test. The discrimination results demonstrated that discriminating English /ʌ/-/ɑ/ was more difficult than discriminating English /æ/-/ʌ/ for Japanese speakers, while English speakers discriminated both vowel contrasts equally well. This result confirmed the PAM prediction based on the goodness rating result, i.e., English /ʌ/ and /ɑ/ were perceived as equally good exemplars of Japanese /a/ but English /æ/ was the poorer exemplar of Japanese /a/ than was English /ʌ/. In addition, according to NRV (Polka & Bohn, 2003, 2011), detecting the change from English /ɑ/ to /ʌ/ is more difficult than detecting the change from /ʌ/ to /ɑ/ for Japanese speakers due to the vowel peripherality effects, and this directional asymmetry should be larger for the /ʌ/-/ɑ/ contrast than for the /æ/-/ʌ/ contrast (Tyler et al., 2014). These predictions were also supported by the present study results, suggesting that the vowel peripherality effects are apparent when the non-native vowels are perceived as equally good exemplars of a single native phoneme.

Topics: Cross-language and nonnative perception, Vowel perception

Epenthetic copy vowels in L2 speech perception

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Japanese listeners perceive an epenthetic vowel, most often [ɯ], after coda consonants in non-native stimuli (e.g., [ebzo] perceived as [ebɯzo]; Dupoux, Kakehi, Hirose, Pallier & Mehler, 1999). This process reflects the insertion of the same vowel in loanwords (e.g., Christmas → [kɯɾisɯmasɯ]). In loanwords with a velar fricative coda, however, the epenthetic vowel is a copy of the previous vowel (e.g., Bach [bax] → [bah:a]). We examine the perceptual equivalent in Japanese listeners, to investigate the possible perceptual origin of these patterns of loanword adaptation.

Twenty-two native Japanese speakers residing in France participated in two experiments with German stimuli. First, we assessed which vowel they perceived, if any, within consonants in VC1C2V-items, with V a vowel in [a,e,i,o], C1 either [x] or [k], and C2 set to [p] (e.g. [oxpo], [ikpi]). Second, we assessed their discrimination between these items and minimally different ones containing an extra identical vowel (e.g. [axpa]-[axapa], [ekpe]-[ekepe]).

In the identification task, among the epenthetic responses, there were more copy vowel responses than default [ɯ] responses after [x] (52.1% vs. 14.0%; p<.02) and viceversa after [k] (9.6% vs. 85.7%; p<.0001). In the discrimination task, accuracy was lower in [x]-trials than in [k]-trials (83.1% vs. 91.8%; p<.04).

Thus, during perception Japanese listeners tend to epenthesize a copy vowel and not the default [ɯ] after coda [x], which mirrors the pattern observed in loanwords. This is taken as evidence for the involvement of online non-native speech perception on loanword adaptation. Overall, however, performance was relatively good, i.e. less than 50% epenthesis in identification and more than 80% accuracy in the crucial [x]-trials in discrimination. This contrasts with the lower performance levels in Dupoux et al. (1999). We currently test Japanese listeners in Japan to examine whether the high performance in our experiments is a result of L2 learning.

Topics: Consonant perception, Cross-language and nonnative perception, Psycholinguistics, Vowel perception

Do teachers experience attrition in their vowel perception capacity after some years of graduation?

Yasna Pereira, University of Concepcion

The loss of language knowledge or capacity to use this knowledge (attrition) has been described as a natural phase for native and non-native speakers as their level of proficiency changes (Hansen, 2001). The main focus of attrition studies has been on the loss of lexical, semantic and syntactic areas (Köpke & Schmid, 2004) more than on speech perception. This study aims at measuring if there is attrition in the perception of English vowels in EFL teachers (non-native speakers of English) who have been teaching for 4 to 6 years after graduating from university. Their capacity will be compared with a group of students in their final year at university to establish if there is any attrition. Linguistic and non-linguistic factors that might be related to their perceptual capacity will also be presented. Participants were 20 EFL teachers and 17 university students (Teacher training programme) who were tested with a listening test (Oxford Placement test 2, Listening test; Allan,1998) language proficiency test (www.englishtag.com), a perceptual English vowel test (CVC words, 8 repetitions of each, 11 vowels. Schwa excluded) and an online survey. Results show that the teachers' listening capacity is a good predictor of their L2 speech perception capacity for both groups. However, no significant difference in their vowel perception test as between-group factor was found. For EFL teachers, the extra input and experience in an L2 country show to make a difference with respect to their capacity to perceive some English vowels. Overall, no attrition would be observed in teachers' capacity to perceive English vowels when compared with university students in their final year at university. Extra factors like attitude and amount of language use and exposure were also explored and will be presented for the EFL teachers, as well as implications for teaching and learning.

Topics: Vowel perception

Perception vs. production interface in L3 phonological development of young multilinguals

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Although there is ample research investigating L2 perception/production (e.g. Halle, Best and Levitt 1999; Ingram and Park 1998 for rhotics), this interface has been rarely addressed from a multilingual perspective. Such studies are necessary to provide more insights into L3 phonological acquisition and inform relevant theories (Cabrelli Amaro and Wrembel 2016).

The present contribution aims to investigate longitudinally a potential relation between the production and perception performance of rhotic sounds in the L2 and L3 of young multilinguals whose languages differ in the realization of this feature. The study involved 14 adolescents (aged 12-13) with L1 Polish and L2 English (after 6 years of learning), who began learning German as their L3 at school. They were tested three times: T1 - after five weeks into learning L3 German, T2 - after five months, T3 - after ten months. Production involved delayed repetition tasks in the respective languages, in which target words with rhotics were embedded in a carrier phrase. The recordings were analysed auditorily by three phonetically-trained raters. The perception test involved a forced-choice goodness task in both L2 and L3, submitted in E-prime, including two renditions of the same phrases which differed minimally on the last stimulus items.

The rate of target-like productions of rhotics as well as the accuracy of perception in L2 and L3 was calculated. The results show that developmental patterns in perception and production were related over the course of time. For L2 and L3 treated jointly, Spearman´s rank correlation was significant yet negative at T1 (Rs= -0,65), and high and positive at T3 (Rs=0.79). No significant correlations were found when the languages were analysed separately. The findings support a preliminary hypothesis that perception vs. production interface develops as the function of time of learning and that L2 and L3 systems interact in multilingual learners.

Topics: Bilingualism and multilingualism, Consonant perception, Consonant production, Cross-language and nonnative perception

The impact of listeners' shared background, international experience, and proficiency on the intelligibility, accentedness, and comprehensibility of Asian Englishes

Jette Hansen Edwards, The Chinese University of Hong Kong

This talk will examine the impact of three listener factors – shared background, international experience, and proficiency – on the accentedness, comprehensibility, and intelligibility ratings for four varieties of English: Hong Kong English, China English, Singapore English, and American English. As such, this talk will contribute to the growing body of research on the intelligibility of English as a lingua franca in Asia. The talk presents data from three studies, all of which employ the same speaker data from 20 speakers (5 each from Hong Kong, Singapore, China, and the United States). Twenty-second excerpts from two tasks (reading and conversation) were embedded into an online questionnaire. Three separate groups of listeners were asked to rate and evaluate each of the 40 (20 speakers x 2) extracts on accentedness, comprehensibility, intelligibility: 1. 105 listeners with the same background as the speakers (Singapore, Hong Kong, USA, and China), to examine the effect of shared background; 2. 30 raters each from the US and Hong Kong, half of whom had extensive international residency experience (6+ months in Asia for the US listeners and 6+ months in an English-speaking country for the Hong Kong listeners), to examine the effect of international experience; and 3. 80 listeners from Hong Kong placed at 5 different English proficiency levels, to examine the impact of proficiency. Pedagogical implications for models and methods for teaching English in Asia will be discussed in relation to the findings.

Topics: Attitude and identity, Bilingualism and multilingualism, Intelligibility and comprehensibility

Poster Presentations 1 September (P3-01 – P3-26)

One-year longitudinal study of American English vowel production by Japanese children: a focus on /ɚ/ sound

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Tsuneo Kato, Doshisha University
Seiichi Yamamoto, Doshisha University

Speech Language Model (SLM) explains that category assimilation occurs when an L2 learner fails to form a new category for an L2 sound, and category dissimilation occurs when the learner forms a new category for an L2 sound and differentiates the new L2 category from existing categories. It is generally difficult for Japanese learners of English to identify certain English vowels, both in perception and pronunciation. This is due to different vowel systems; Japanese has five monophthongs, /a/, /i/, /u/, /e/ and /o/, whereas English has more than ten. Furthermore, the Japanese writing system greatly affects the learner's production of English speech. Specifically, many English words are adopted into Japanese as loanwords by replacing the sounds with Japanese syllables and the letters with kanas (Japanese syllabary characters).

We measured the formant frequencies of vowel segments in various phonetic contexts in English speech produced by native Japanese children aged 10-11 biannually in a Japanese elementary school, and compared them with those of native-English-speaking American children of the same age. The results indicated that the mean distance of ten English vowels between each Japanese child and the average American was highly correlated with their distance of the English vowel /ɚ/(er) in normalized formant space. The Japanese language replaces English /ɚ/ with Japanese /a/ to adopt English loanwords, and this is considered to adversely lead to assimilation of /ɚ/ into Japanese /a/. We focused on the change in distance between /ɚ/ and four English low/mid vowels which are also replaced with Japanese /a/. These results indicated that the individual /ɚ/ sound tended to either assimilate or dissimilate from Japanese /a/, although the average distance increased (i.e. dissimilation). The distance between /ɚ/ and other low/mid vowels of 12 girls and 8 boys, both out of 18, increased over one year.

Topics: Age effects, Cross-language and nonnative perception, Vowel production

Phonetic Realization of Paralinguistic Information: Analysis of L1 and L2 German Speech with Modal Particle schon.

Miki Ikoma, Waseda University

In German, modal particles (MPs) are often used in order to convey various kinds of paralinguistic information. MP schon is used to express rebuttal, conviction or reservation. According to our studies, in which the utterances with MP schon by L1 German speakers were analyzed acoustically, we found some specific prosodic characteristics among different kinds of paralinguistic information.

It has been argued that phonetic properties, by which paralinguistic information is expressed, are often dependent upon each language, with some universal aspects at least in perception (Mori et al 2014). In our previous studies, we also found some common prosodic properties among utterances with MP schon and the Japanese sentence final particle yo.

Here, the question arises whether there are any differences in phonetic characteristics with MP between L1 German speakers and Japanese learners of German. According to Mori et al. (2014), paralinguistic information is not only conveyed by prosody but also by segmental features such as vowel quality. Therefore, the current study analyzed vowel quality, as well as duration, F0 and intensity, to test whether there is a difference in phonetic realization of paralinguistic information between L1 speakers and L2 Japanese learners. On the basis of this analysis, we conclude there are partly common phonetic characteristics in the both L1 and L2 utterances in the case of rebuttal, especially regarding to the duration and vowel quality. In addition to this, we also found some language specific characteristics: The F0 peaks of the rebuttal utterances in L1 were lower than the other paralinguistic intentions, conviction and reservation. On the contrary, in the case of L2, the F0 peaks of the rebuttal utterances were in some cases higher than the utterances of the other attitudes. According to these findings, we will discuss some of the language specific and universal aspects of paralinguistic information.

Topics: Attitude and identity, Intonation, Vowel production

The production of L2 English sentence types by Inuktitut, Mandarin and Spanish speakers. Is typology enough?

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Alana Johns, University of Toronto
Gaby Klassen, University of Toronto
Matthew Patience, University of Toronto
Malina Radu, University of Toronto
Olga Tararova, University of Toronto

Cross-linguistic influence (CLI) is one of the most researched themes in L2 acquisition. However, it remains unclear to what extent prosodic typology allows us to make general rather than structure-by-structure predictions. Moreover, studies suggest that CLI interacts with task-type in modelling L2 speakers' production. Thus, we investigated the L2 production of English statements (Ss), absolute questions (AQs), and declarative questions (DQs), by speakers of three typologically distinct L1s: Spanish, Mandarin, and Inuktitut. English AQs are syntactically and prosodically marked, whereas the difference between Ss and DQs is purely prosodic. In Spanish, Ss and questions differ only prosodically. Mandarin questions can be syntactically identical to statements or they can be marked by the particle – ma. In Inuktitut, statements and questions are morphologically marked, and pitch primarily signals turn-holding. Based on expectations from CLI, we expected Inuktitut speakers to have the most difficulty. Additionally, research on task-effects suggests that all learner groups should perform better in decontextualized than contextualized tasks.

Fifteen Canadian English controls, as well as 15 L1 Spanish, 15 L1 Mandarin and 13 L1 Inuktitut speakers (all advanced) performed a sentence imitation task and a contextualized production task. The pitch change of the first pitch accent and the nuclear contour was analyzed. Group differences were not significant in the imitation task. However, in the contextualized task, Inuktitut speakers outperformed the other two groups in their distribution of sentence types, but they had a smaller pitch range than controls in the first pitch accent. Mandarin and, particularly Spanish speakers, differed from controls to a larger extent in their selection of sentence types (AQs in DQ-prompting contexts) than in the realization of their prosodic contours. Thus, although CLI accounts for the Mandarin and Spanish results, we need to analyze the input received to understand the Inuktitut group's performance.

Topics: Intonation

Presentation Session: P3-04

The influence of a phonetic training in L2 on perceptual lexical processing of L2 speech

Bartosz Brzoza, Adam Mickiewicz University in Poznań

The positive effect of L2 phonetic training on speech production and perception has been observed in literature (e.g. Hazan et al., 2005; Insam, & Schuppler, 2015). The results are mixed, some presenting selected benefits, other reporting no improvements. Additionally, language experience, including exposure to L2 sounds may result in a more accurate word recognition (Imai, Walley, & Flege, 2005; Schmidtke, 2014), as posited within the Lexical Restructuring Model (Metsala, & Walley, 1998). However, there are few studies investigating how L2 phonological acquisition influences perceptual lexical processing.

The current contribution investigates the influence of classroom-based phonetic training in L2 English on the lexical processing of L2 speech. The aim of the study is to investigate whether pronunciation instruction in L2 benefits L2 spoken-word recognition. In order to gain access to various aspects of processing, a series of experiments was conducted: auditory lexical decision tasks, eye-tracking visual world paradigm tasks, and a perceptual judgment task.

24 Polish participants (L2: English; no significant L3s) received an articulatory pronunciation course in L2 English. The course comprised 45 hours of training. Participants' performance on lexical processing tasks was measured pre and post training. Their speech was recorded at these points, too. A comparison group of 29 English participants (no significant L2s) did the same tasks. The performance of both groups was compared.

The results present a multidimensional view of L2 acquisition. Perceptual judgments showed significant gains in participants' production and native-likeness. Reaction latencies and accuracy rates from lexical decision tasks point to a subtle influence of training in selected areas. This effect is milder than in studies involving laboratory-based training. Eye-tracking data reveal more native-like processing post-training, evident in pupil dilation changes. This contribution is the first longitudinal attempt to establish whether L2 phonological development leads to a more native-like L2 lexical processing.

Topics: Audiovisual processing, Bilingualism and multilingualism, Intelligibility and comprehensibility, Psycholinguistics, Training

Differential Focus-Marking in L2 Processing, Perception, and Production of English Intonational Contrast – An Eye-Tracking Study

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Intonation encodes meaning (Levis & Wichmann, 2015). However, L2 English learners fail to exploit English intonation (Pickering, 2001). Studies investigating L2 English speakers' perception of English intonational contrast found that subjects showed some level of sensitivity, but not as much as L1 English speakers (Takeda, Schafer, & Schwartz, 2015). Studies investigating production are missing.

We investigate how participants with different L1s process, perceive, and produce contrastive information, how orthographic conventions affect participants' processing and oral delivery of contrastive information, and whether native and non-native speakers associate intonation change with meaning change. An eye-tracker measuring gaze direction, saccade length, and regression is used to investigate native and non-native speakers' processing of passages containing contrastive information signaled (e.g., italics, bold) or not orthographically. Participants' speech is also recorded and analyzed for pitch level, duration, and intensity using speech analysis software (Praat). Participants complete a background questionnaire and metalinguistic awareness survey; silently read and orally deliver sentences and passages containing contrastive information, signaled or not orthographically; listen and match sentences with intonationally-signaled contrastive information to corresponding meaning choices; complete a post-test interview and metalinguistic survey.

Consistent with prior research, L1 English speakers have statistically significantly higher pitch height, potentially related to a significantly shorter fixation duration, suggesting an L1 processing advantage. L1 English speakers also produced italicized stressed constituents with higher pitch height; this effect was not observed for bolded words. Finally, L2 English speakers spent significantly more time gazing/jumping between the stressed words and parenthesized meanings, suggesting a higher cognitive load in processing meaning-associated stressed constituents. Findings suggest that the differences in L1 and L2 English speakers' prosody stem from a deficiency in processing speaker intent signaled by English intonation rather than an inability to produce target-like intonational patterns. Thus, prosody instruction should move beyond imitation of pitch patterns to cognitive processing.

Topics: Audiovisual processing, Cross-language and nonnative perception, Intonation, Stress and accent

Presentation Session: P3-06

Perceptual Confusion among Japanese Moraic Phonemes: long vowel /R/, moraic nasal /N/, and geminate consonant /Q/, Comparison among Beginner, Intermediate and Advanced

Linshu Zhang, Graduate School of Kobe University

Reiko Akahane-Yamada, ATR/Kobe University

The identification of moraic phonemes is difficult for most Japanese (mora rhythm) learners whose mother language is characterized by syllable rhythm or stress rhythm. To date, many studies about Japanese special morae have mainly discussed how to distinguish between the absence and presence of moraic phonemes (e.g., singleton-geminate consonant), while few are concerned with the process of making distinction among long vowels, moraic nasals and geminate consonants.

We conducted a perceptual experiment to investigate if Japanese learners confuse these three sounds. Three groups (beginner, intermediate and advanced) of native Mandarin speakers learning Japanese participated in the experiment. They were asked to identify the target word from a four-alternative forced-choice question, the four choices of which constructed a minimal set distinguished by the type of mora. The target word was presented in isolation or inserted into the carrier sentence, and the carrier sentence included two types: one that contained semantic information and one that did not). Additionally, the target word we used was either a word or a non-word.

Results show that there was perceptual confusion among three groups of participants, whether the target word was a word or a non-word, among long vowels, moraic nasals and geminate consonants. This was also true regardless of whether the word was presented in isolation or in a carrier sentence. Moreover, geminate consonants always returned the highest error rate, while moraic nasal returned the lowest. In this experiment, participants tended to have more difficulty distinguish words within carrier sentences than in isolation. Compared with the other two groups, beginners tended to be easily affected by contexts (in isolation/in a carrier sentence, word/nonword). The results indicate that it is also important for Japanese learners to attend to the differences among long vowels, moraic nasals and geminate consonants, and not only between moraic and non-moraic phoneme.

Topics: Audiovisual processing, Cross-language and nonnative perception, Rhythm

Neuroplasticity for consonant cluster processing in English and Mandarin-speaking adolescents: the transcranial direct current stimulation effect on mismatch negativity

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Jungmoon Hyun, City University of New York
Xiao Ling Zeng, Bronx High School of Science
Yan Yu, St. John's University

Language experience and brain maturation both shape speech processing at the cortical level. Studies investigating neural correlates of speech processing in older children are generally few, and rare for bilinguals. Recently, there is a widespread interest in using noninvasive brain stimulation in developmental neurological disorders, but few studies have examined healthy, developing populations. To examine whether transcranial direction stimulation (tDCS) shows any effect on automaticity of neural speech processing in relation to language experience in children, we recorded event-related potentials (ERP) to a speech contrast both before and after administering tDCS. We used an oddball paradigm in which consonant cluster onset in /bli/ (a phonotactic pattern in English, but not in Mandarin) was the frequent/standard stimulus, and the deviant/change stimuli were "beli-30" with a short schwa (30 ms) and "beli-60" with a long schwa (60 ms) after the initial /b/. The participants were children (14-19 years old; N = 34) from monolingual English-speaking households, or bilingual English-Mandarin speaking households. As hypothesized, both groups showed clear neural discrimination; in the subtraction waves (deviant minus standard), we observed a mismatch negativity (MMN) peaking around 250 ms, and late negativities (LN), peaking around 350 ms (LN1) and around 550 ms (LN2). The monolingual English children showed a larger amplitude MMN to the beli-60 than the beli-30 stimulus, but no difference was observed for the bilingual children. In addition the amplitude of LN1 and LN2 were larger for the beli-60 than the beli-30 deviant. The preliminary analyses of ERP responses before and after tDCS suggest that one short session of tDCS does not influence neural discrimination of speech in typically-developing children.

Topics: Bilingualism and multilingualism, Consonant perception, Cross-language and nonnative perception, Lexical tones, Neurolinguistics

Effects of L1 neural representation on the encoding and discrimination of an English consonant cluster by Korean listeners

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Kyung Eun Lee, City University of New York

Valerie L. Shafer, City University of New York

The study examines how first language (L1) experience modulates neural processing of new complex phonological speech patterns found only in second language (L2) by Korean listeners. Unlike English, Korean does not include stop-liquid consonant clusters in syllable onsets; as a result, Korean listeners perceive an epenthetic vowel between consonant clusters (e.g., "blow perceived as "below) (Kabak & Idsardi, 2007). The current study examined the time-course of processing from encoding to neural discrimination using Event-Related Potentials (ERPs). We hypothesized that obligatory P1-N1-P2 measures would faithfully track the acoustic-phonetic patterns while the Mismatch Negativity (MMN) measure would reflect discrimination. Preliminary data were obtained from six native Korean listeners (4 females; mean age = 34.5; mean age of L2 acquisition = 24.8) who learned English as a second-language and from nine native English participants in an oddball paradigm. Participants received /bli/ as the standard stimulus (80% of trials) and /bəli/-30 ms and /bəli/-60 ms as deviants (10% each). In a second condition, /bəli/-60 ms served as the standard and /bəli/-30 ms and /bli/-0 ms as the deviants. Preliminary data revealed highly similar P1-N1-P2 waveform morphology across both groups indicating veridical encoding of the phonetic information. In contrast, the MMN was later in time, compared to English participants, or absent for 4/6 and 3/6 Korean participants for conditions 1 and 2, respectively. In addition, the Korean participants showed better neural discrimination of /bəli/-30 from /bli/-0 than from /bəli/-60. These findings indicate that discrimination of L2 phonological contrasts are modulated by L1 language experience. These findings add to the small, but growing literature demonstrating that the obligatory responses P1-N1-P2 closely track the acoustic-phonetic information in speech, whereas the MMN reflects phonologically relevant distinctions learned early in life.

Topics: Bilingualism and multilingualism, Consonant perception, Cross-language and nonnative perception, Neurolinguistics

Asymmetry in Complex Word Processing: Evidence from English Derivatives

Lei Gu, The Chinese University of Hong Kong

For the past decades, processing of complex words has been attracting as much attention as debate in psycholinguistic literature. The crux of the long-running debate boils down to how complex words are being processed. Several proposals have been made to model the morphological processing: Morpheme-Based Model that supports concatenative processing, Word-Based Model that favors holistic processing, Dual System Model that conflates both (mixed processing). However, attempts made so far have neglected 1) whether these models also apply to phonological processing), 2) whether morphological processing matches phonological processing, 3) whether factors affecting morphological processing also influence phonological processing. In this study, two masked priming tasks (morphological & phonological) with English complex words (derivatives) were administered to both native American English speakers and Chinese EFL speakers. In both tasks, native speakers fared consistently better than the nonnative counterparts because of their native language proficiency. Both priming tasks showed both native and nonnative speakers had mixed processing patterns: frequent and transparent words tended to elicit holistic processing whereas infrequent and opaque words tended to elicit concatenative processing. The results also showed morphological processing differed from phonological processing, as morphemic boundaries do not always match prosodic boundaries. The results also showed morphophonological processing was influenced by a string of objective factor including word frequency and transparency, as well as a string of subjective factor including speakers' familiarity and morphological knowledge of complex words. In a word, this study showed Dual System Model better fitted the morphophonological processing of English derivatives for both native and nonnative speakers. This study also suggested an asymmetrical relationship between morphological and phonological processing. This study also suggested the rank of major factors that affected morphophonological processing of English complex words.

Topics: Bilingualism and multilingualism, Modeling, Psycholinguistics, Stress and accent

Effect of voicing duration on the perception of synthesized /na/ by Korean listeners

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Takayuki Arai, Sophia University

Korean nasal consonants reportedly undergo denasalization or nasal weakening in word-initial position (Yoshida, 2008; Kim YS, 2011). They may not only lack the nasal resonance, but also the voicing itself (Ahn , 2013). The present study investigated the effect of consonant duration on the perception of nasal consonants for native Korean listeners using continua created with a Klatt synthesizer. The consonants of the stimuli were either prevocalic oral consonants or nasal that they could be interpreted as [na] or [da]. The voice onset time (VOT) of the stimuli varied between -70 ms to 0 in 10 ms-step. In a rating test, 23 Korean listeners rated /na/-likeness of the stimuli on a 7-step scale. The change in consonant duration had a certain effect on /na/ perception, especially between the stimuli with 0 and -10 ms VOT in the continua with an oral vowel. In a yes-no test, perceptual judgement for /na/ was obtained from 14 native Korean listeners who also participated in the rating test, but this time on the phonemic level. The 0 VOT-stimuli had lower proportion of responses as /na/ than the stimuli with longer consonant duration. However, the duration had less or little effect for the stimuli with the duration longer than 10 ms. Some listeners evaluated all or most of the stimuli as /na/. These results show that while some Korean listeners are able to perceive the phonetic level difference regarding duration of prevoicing to some extent, they may tolerate the lack of nasal resonance or voice lead for nasal consonants.

Topics: Consonant perception

The predictive role of cross-language phonetic similarity in L2 consonant learning

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Theoretical models of L2 speech acquisition (Best & Tyler, 2007; Escudero & Boersma, 2004; Flege, 1995) hypothesize that degree of perceived phonetic similarity between the L1 and L2 phonological systems predicts the relative ease/difficulty in L2 speech learning. The goal of this study is to further our understanding of the role of cross-linguistic (CL) phonetic similarity measures in L2 speech acquisition by examining their predictive role in L2 consonant learning. Specifically, it aims to assess CL perceptual and acoustic similarity between the consonants of L2 European Portuguese (EP) and L1 Canadian English (CanE); make predictions regarding the learning of L2 EP consonant sounds (/p, t, k, b, d, g, ʃ, ʒ, n, ɲ, l, ʎ, ɾ, r /); test the predictions by examining the perceptual and production performance of two groups of CanE speakers varying in Portuguese-language experience; and assess whether experience with the target language affects the patterns of L1-L2 perceived phonetic similarity in the mind of the L2 speakers. Twenty-two inexperienced (naïve) and 24 experienced adult CanE listeners completed a perceptual assimilation task and a rated dissimilarity task. The experienced group also completed two elicited L1 and L2 production tasks to measure CL acoustic similarity and examine their L2 production. The analyses revealed that both the degree of CL acoustic and perceptual similarity between CanE (L1) and EP (L2) consonants predicted the discrimination and production of the target speech sounds; however, the perceived phonetic similarity measure of CL comparison did not fully account for the difficulty in the production of the L2 consonants /ɲ, ʎ, r/. Perceptual assimilation patterns of the new EP contrasts /n-ɲ/, /l-ʎ/, and /ɾ- r/ changed significantly as a function of experience, with a significant increase in the difference between the fit indexes of the two L2 consonants of each pair.

Topics: Consonant perception, Consonant production, Cross-language and nonnative perception

Presentation Session: P3-12

Second Language Perception of English Word-Boundary by L1 Mandarin–L2 English speakers

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Previous studies on word-boundary perception in English have reported a preference of prevocalic glottal stop cue (e.g., 'seen [ʔ]ice' vs. 'see nice') over word-initial aspiration cue (e.g., 'keeps [tʰ]alking' vs. 'keep s[t]alking') both by native English speakers (Nakatani & Dukes, 1977) and by learners of English from various L1 background (Spanish: Altenberg, 2005; Japanese: Ito & Strange, 2009; French: Shoemaker, 2014). This study investigates English word-boundary perception by Mandarin learners of English, whose native language uses stop aspiration, but not glottal stop, contrastively. The question is whether their sensitivity to stop aspiration would help them to use the cue in L2 word-boundary segmentation since aspiration is phonemic in Mandarin. Thirty-eight Mandarin L2 learners of English, sub-grouped into three proficiency levels based on their length of residence in the U.S., and twenty-eight monolingual native English speakers participated in this study. The participants were tested with the stimuli containing pitch-manipulated English pseudo-words with either an aspirated stop or a glottal stop marking the word boundary, chosen from ARC non-words database (Rastle et al., 2002). The results showed that Mandarin speakers identified word boundaries more accurately when the stimuli had glottal stops than when they had aspirated stops, despite that their native language has contrastive stop aspiration ($p=0.0016$). This outcome suggests that perceptual sensitivity to a certain acoustic cue in learners' L1 does not help them use the cue readily in L2 word-boundary perception. The between-group comparison also showed no significant difference in accuracy between the two groups (75.46% vs. 72.75%; $p=0.9366$) when the effects of lexical knowledge and potential pitch cue for word boundary were controlled. These results suggest that glottal stop may indeed be a universally unmarked acoustic cue for the task of word-boundary segmentation. The length of residence of L2 learners and the role of L1 transfer were also discussed.

Topics: Consonant perception, Cross-language and nonnative perception

Perception of Japanese consonant length contrast by native Korean listeners: Influence of L1 phonetic similarity to L2 perception

Mee Sonu, Saitama University
Hiroaki Kato, NICT
Keiichi Tajima, Hosei University

Japanese words can be distinguished by consonant length, e.g. "haken" (dispatch) and "hakken" (discovery). When listening to Japanese, Koreans generally show a perceptual bias toward geminate consonants (Sonu et al., 2013, DOI:10.1007/s10831-013-9107-1). To investigate this bias, perception experiments were conducted. Synthetic speech continua were generated based on pairs of unaccented nonsense words of the basic form /erete/-/eretːe/ produced by a native Japanese speaker and a native Korean speaker. Three listener groups—native Japanese, native Koreans with no Japanese learning experience, and native Koreans learning Japanese—attempted a single-stimulus, two-alternative, forced-choice identification task. Japanese listeners judged both stimulus sets by using "singleton" or "geminate" responses. Native Koreans with no Japanese learning experience judged the stimuli by using "lenis" or "fortis" responses. Native Koreans learning Japanese judged "singleton" or "geminate" in Japanese and "lenis" or "fortis" in Korean. Logistic modeling was performed using perceptual indices, boundary position, and slope. For each continuum, the perceptual boundary position was estimated to be the closure duration at which the listeners' response rate for the geminate or fortis consonant or the long vowel reached 50%.

In case of stimuli embedded in carrier sentences with mixed speaking rates, Japanese listeners' identification boundaries systematically shifted owing to speaking-rate changes. Further, for native Korean listeners, the boundaries of Korean "lenis" and "fortis" were shorter than those of Japanese "singleton" and "geminate." Thus, Korean listeners' boundaries shifted toward lenis consonants (toward shorter end) when identifying Japanese stop consonants, supporting the theory that the Koreans' bias toward geminate stop consonants stems from their use of perceptual criteria in their native language. Additionally, without carrier sentences, Japanese consonant length contrast boundaries showed an opposite shift, suggesting that Koreans' perceptual boundary is based on the absolute duration of a segment. Finally, the perceptual similarity between Korean intervocalic consonants and Japanese geminate consonants is also discussed.

Topics: Consonant perception, Cross-language and nonnative perception

"Perceptual repair" does not stem from phonotactics: evidence from English listeners of Russian stimuli

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A perception experiment has been conducted to investigate the place misperception patterns of onset clusters. Using Hebrew onset clusters /tl, dl/ as their stimuli, Hallé et al. (1998) and their line of research have argued that English and French listeners perceptually assimilate the place of articulation of the plosive to velars, so that phonotactically attested sequences /kl, gl/, in their mother tongue, are yielded. In contrast, using both Hebrew and Russian /tl, dl/ clusters, the current research attempts to show that it is not the phonotactics of listeners' native language that drives the place shift phenomenon. The results explicitly show that the same sequences of phonemes from the two languages induce disparate misperception patterns. Hebrew coronal-lateral clusters are overwhelmingly misperceived as velar-lateral sequences, while Russian equivalents receive a considerable amount of labial responses, together with more accurate identification of the coronal plosive. Although the "velar shift" pattern of Hebrew stimuli is a precise replication of the preceding literature, the "labial shift" pattern and the veridical perception of Russian stimuli cannot be explained by grammar or statistical knowledge, both universal and language-specific. The research will argue that the mechanism that underlie the place shift has its root in bottom-up, autonomous processes, which rely on auditory information. Furthermore, building on the classic findings of Cooper et al. (1952) that the identification of plosive place is a corollary of acoustic features, the research will discuss what dimensions of signal are responsible for plosive place perception before laterals, and how those criteria can be transformed or substituted during non-native speech perception.

Topics: Consonant perception, Cross-language and nonnative perception

Perception and reinterpretation of English song lyrics by native speakers of Japanese: A case study of samples from the TV-show Soramimi-Hour

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Mondegreens occur when a listener perceives words differently from those actually produced by the singer [1], [2], particularly when the lyrics are not in the native language of the listener. This auditory illusion is well known in Japan for the popular TV-show Soramimi Hour, in which viewers submit misheard lyrics which are then evaluated by the show's hosts.

In this study, we argue that this reinterpretation of English song lyrics by Japanese L1 speakers is a result of their perception of the lyrics through Japanese phonology and subject to Japanese phonotactic constraints, which only allow open syllables but no consonant clusters, or consonant codas except for /n/ [3], [4]. Words of foreign origin that enter Japanese are processed through this phonotactic filter, which not only affects the syllable structure of the word, but also influences how native speakers perceive both native and foreign words.

In order to examine how Japanese native speakers render English song lyrics, we examined 40 examples of soramimi. Both the original English lyrics and their Japanese counterparts were rendered into IPA using perceptual transcription. Examples were categorized as deletions, insertions or substitutions of sounds [5]. Preliminary results show that the (successful) soramimi tend to (1) substitute English sounds with the closest Japanese alternatives, (2) insert vowels to break up consonant clusters or avoid consonant codas, and (3) parse coda consonants following a long vowel in English as syllable onsets in Japanese. Results indicate a preference for reanalysis of word boundaries over insertion, meaning that consonants at the end of a word in the English version tend to get perceived as the beginning of a following word in Japanese. We argue this is due to the fact that inserting more vowels would both change the sound sequences too much and also affect the rhythm of the lyrics.

Topics: Consonant perception, Cross-language and nonnative perception, Vowel perception

A feature-based account of new L2 category formation

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This study concerns Japanese listeners' perception of American English (AmE) vowels /ɛ, æ, ʌ, ɑ/, which are assimilated to Japanese mid front /e(ee)/ or low central /a(aa)/ (Strange et al., 1998). AmE low front /æ/ is of particular interest because it is known as a poor exemplar of Japanese /a(aa)/ and therefore is subject to new category formation (Flege, 1995; Best & Tyler, 2007; Escudero, 2005). The current study adopts a feature-based account of speech perception (Boersma, Escudero & Hayes, 2003; Chládková & Boersma, 2011) to explain how a new category might be formed for this L2 sound. A perception experiment was conducted to investigate how Japanese learners of English perceive L1 /ee, e, aa, a/ and L2 /ɛ, æ ʌ, ɑ/. Thirty-six listeners (22 male, mean age = 21.3) who had never resided outside of Japan participated. The stimuli were 64 /bVs/ tokens, in which the F1, F2 and duration of /V/ were manipulated to differ systematically. The experiment consisted of Japanese and English sessions, and participants categorized the stimuli into "beesu" ('base'), "besu" ('Bess'), "baasu" ('birth') or "basu" ('bus') in the Japanese session and into "Bess", "bass", "bus" or "boss" in the English session. Each stimulus was randomly presented four times (total of 256 trials) per session. Logistic regression coefficients were calculated to estimate participants' relative reliance on the three acoustic dimensions for vowel identification (Morrison, 2007). Linear mixed-effects models found that participants perceived AmE /æ/ as significantly 'fronter' than Japanese /a/, i.e., /æ/ is /low, front/ (t = 2.419, p = 0.016). Using a feature-based account, it can be explained that AmE /æ/ is a poor exemplar of Japanese categories because the /low/ and /front/ features do not occur simultaneously in Japanese (*/low, front/) and that they successfully learned this combination of features in L2 AmE.

Topics: Cross-language and nonnative perception, Modeling, Vowel perception

Effects of POV and Amplitude on Identification of Syllables by L2 Speakers of English

Tamami Katayama, Kumamoto University

When native Japanese speakers hear an illegal syllable structure, they perceive illusory vowels (Doupoux, 1999) and the question is whether this is caused by L1 phonotactic constriants by a listener or by acoustic information. This study was carried out to determine the effects of low-level acoustic information on perception of a vowel by native Japanese speakers when they hear non-words both with legal syllables and illegal syllable structures in their L1. The effects of pre-obstruent voicing (POV) and amplitude on perception of a vowel both in legal (V1C1UC2V2) and illegal (V1C1C2V2) phonotactic contexts by native Japanese speakers were examined. Four kinds of non-words with legal phonotactic contexts (e.g., egbu) and their counterparts (e.g., egubu) with legal styllable sturcture produced by a native English speaker were manipulated with POV by eliminating it in steps (25%, 50%, 75% and 100%) and with amplitude by increasing it (+3 dB and +6 dB) and decreasing it (-3 dB and -6 dB). Then, the sound stimuli in which POV was eliminated were again manipulated by increasing and decreasing the amplitude in two steps. Ten native Japanese speakers without living experince in English-speaking coutries were given sound stimuli (200 in total) through headphones of a computer and were asked to identify whether the non-words have a vowel between the consonants. The results showed that the participants identified the sounds with illegal phonotactic structures more accurately than the syllables with legal structures, though there was no sigfnicant difference between responses to the legal syllabes and the illegal syllables of original sounds. When the amplitude was decreased, the participants tended to identify V1C1UC2V2 words as V1C1C2V2 words. This suggested that listeners processed the low-level acoustic information directly without modulating it to match their L1 phonotactic constraints.

Topics: Cross-language and nonnative perception, Psycholinguistics, Vowel perception

L2, L3 and Heritage Acquisition of Chinese Tone Sandhi: An Exploratory Study

Jie Deng, University of Victoria

Most third language acquisition (L3A) research has focussed on morphosyntax. And within the understudied L3 phonology, few studies address perception of suprasegmental features (Cabrelli Amaro & Wrembel, 2016). Mandarin has contextual tone-adjustment rules known as tone sandhi (TS), and no study has worked on L3A of TS. Following (Qu, 2013), I assume that Chinese is a stress language with trochaic feet, exhibiting a tone-to-weight principle that motivates TS processes. My pilot study is concerned with (a) whether TS can be acquired by classroom learners, (b) whether TS affect comprehensibility and accentedness, and (c) whether L2ers, L3ers and heritage learners are perceived differently by native Chinese speakers.

Forty disyllabic Chinese words (10 sandhi and 30 non-sandhi) were read by 12 learners. Each word was judged by 3 native raters on a 9-point scale for comprehensibility (1 being highly comprehensible and 9 being highly incomprehensible) and accentedness (1 being native-like and 9 being heavily accented). A Wilcoxon Signed Ranks Test show a significant difference between sandhi and non-sandhi words' comprehensibility (p=.05), with sandhi words being less comprehensible than non-sandhi words (4.35 versus 4.01/9). This suggests that Chinese learners have not yet mastered TS in Chinese (which is not necessarily surprising in classroom Mandarin). And yet, no significant difference (p=.08) was found for accentedness.

When looking into learners' language background (English L2ers, heritage and English-French L3ers), the Linguistic Proximity Model (LPM), Westergaard et al., (2016) would predict facilitative influence from English to Chinese TS acquisition due to similar foot structure (unlike French). However, the data are at odds with the LPM since English-French L3ers outperformed English L2ers in both comprehensibility (4.37 versus 5.44/9) and accentedness (4.92 versus 5.81/9). Furthermore, the data supports Polinsky (2015) that heritage L3ers show advantages over other L2ers/L3ers for they receive better comprehensibility (3.22/9) and accentedness (3.39/9) ratings.

Topics: Bilingualism and multilingualism, Intelligibility and comprehensibility, Lexical tones, Stress and accent

A corpus-based study of L3 French schwa production by Japanese learners of intermediate proficiency: to drop or not to drop?

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Romain Isely, ELCF, University of Geneva

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Japanese learners' interphonology has been extensively studied over the past 50 years, both on the segmental and suprasegmental levels, with English as their main target language (e.g. Kondo et al. 2015). Recently, researchers in the field of corpus phonology have begun investigating the acquisition of L3s, such as French (Detey et al. 2015) or Spanish (Carranza et al. 2014). While the production of L2 English schwa by Japanese learners has been analyzed (Sugiura 2015), almost no research has been conducted about L3 French schwa, an essential component of French and a peculiar phonological object, i.e. a semi-constrained schwa/zero alternation which does not affect the meaning of the morpheme they pertain to. In this presentation, we describe the results of a corpus-based study of 9 Japanese learners of intermediate proficiency in French, and compare their production with a native speakers' database, using a similar multi-task recording and coding protocol (Durand et al. 2002). Our presentation focuses on two variables: syllabic position (monosyllable vs initial or medial position in polysyllabic words) and task (text reading vs spontaneous speech). Both variables seem to have a significant effect on the production: more schwa deletion in medial position than in the other two, and more schwa deletion in spontaneous speech than in text reading, pointing to a possible orthographic effect. Overall, our results reveal much less schwa deletion by Japanese learners compared to native speakers. Furthermore, 3 out of the 9 participants were recorded a second time one year later to assess the stability of their schwa production system, which is somehow surprisingly confirmed. The results are discussed in light of L2 acquisition models, including potential transfers from L1 Japanese and L2 English phonological templates.

Topics: Sociophonetics, Teaching and assessment, Vowel production

Perceptual training, cross-linguistic similarity and L2 perception and production

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Previous work shows that high variability phonetic training (HVPT) can improve second language (L2) learners' perception and production of L2 sounds (e.g., Logan et al., 1991; Iverson et al., 2012; Sakai & Moorman, 2017). L2 speech theories claim that L2 learners need to detect differences between native and target language sounds in order to perceive and produce them accurately (Flege, 1995; Best & Tyler, 2017). The current study aimed to examine the effect of identification and discrimination HVPT on the perceived similarity between L1 and L2 vowels by L2 English learners and on the ability to perceive and produce target English vowels. Thirty-eight Spanish/Catalan speakers learning English as an L2 completed a 6-session perceptual training regime. Trainees differed in the type of perceptual training method they received, either through identification tasks or through discrimination tasks. Before and after training, learners were tested on their ability to discriminate and identify a set of English vowels. In addition, cross-linguistic similarity was assessed by means of perceptual assimilation tasks, in which learners identified target vowels in terms of L1 vowels and provided goodness of fit ratings. Participants also produced a number of English words elicited by means of a picture-naming task. The results revealed no consistent change in similarity relations between L1 and L2 sounds from pretest to posttest, suggesting that the perceptual training regime did not affect cross-linguistic perceived similarity. However, training was effective in improving both identification and discrimination of L2 sounds. Identification trainees improved the most in L2 identification, but all trained groups showed comparable improvement in discrimination. The impact of perceptual training on production was more limited, as there was no consistent improvement from pretest to posttest. Results are discussed in terms of the relationship between perceptual training, cross-linguistic similarity and L2 categorization.

Topics: Cross-language and nonnative perception, Training, Vowel perception, Vowel production

Examining the Modality-specificity of Phonetic Training Paradigms: Training Hong Kong Cantonese ESL learners' Perception and Production of British English High Front Vowels

Janice Wing Sze Wong, Hong Kong Baptist University

To understand further the relationship between speech perception and production, previous studies used auditory (e.g. Bradlow et al., 1997; Iverson et al., 2012) or production training (e.g. Baese-Berk & Samuel, 2016; Kartushina et al., 2015), for instance, to examine whether learning in one modality can be transferred to the other. While participants were ensured to receive training only in the perception domain during auditory training, previous production studies were not truly "production-only"—not all auditory components, such as participants' self-production, were isolated. This study, thus, attempted to investigate the cross-modality effect by gauging the training efficacy of an auditory-only and a production-only paradigm on the perception and production of a confusing English vowel contrast, /ɪ/-/i/, by Cantonese learners of English. The production-only paradigm, modelled after Sakai's (2016) design, ensured no access to the auditory feedback loop by requiring participants to wear a noise-cancelling headphone with white noise to eliminate any self-produced aural or bone-conducted input. Sixteen Cantonese speakers were equally divided into the auditory group (A) and the production group (P). All auditory stimuli for Group A were CVC words produced by 6 native Standard Southern British English speakers. The production training involved participants pronouncing the same set of words used in the auditory training without any auditory reference. Participants could only adjust their pronunciation based on some given real-time visual feedback. Word-level identification and production pre/post-tests were given to measure participants' performance. Identification scores, F1 and F2 of all production tokens were analyzed.

Both groups showed robust perceptual and production improvement, signifying that learning in one domain can be transferred to the other. Group A also outperformed P significantly in both domains. The results not only suggested the interdependence of the two modalities, but also further substantiated the "perception-first" view in L2 speech learning, yielding pedagogical and theoretical implications.

Topics: Cross-language and nonnative perception, Vowel perception, Vowel production

Perception of L2 Spanish Lexical Stress by L1 English Listeners

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This study looks at the extent to which L1 English listeners are able to use their knowledge of Spanish lexical stress to perceive stress contrasts in novel Spanish words of differing syllable types. Spanish is a syllable-timed language with phonemic lexical stress, meaning that there are minimal pairs that only differ in which syllable stress falls on. Studies such as Kim (2015) and Romanelli et al. (2015) have investigated the acquisition of Spanish lexical stress and found that L1 English listeners can experience difficulties perceiving minimal pairs of this sort. The research questions the present study intends to answer are: (1) How do L2 Spanish learners perceive lexical stress contrasts?; (2) Does word length (disyllabic vs. trisyllabic words) play a role in the perception of Spanish L2 stress; 3) Are Spanish learners able to distinguish lexical stress contrasts pseudo-words? The participants were 10 L1 Canadian English listeners who were beginner students of Spanish. The participants took part in a series of ABX discrimination tasks in which they had to discriminate between pairs of disyllabic and trisyllabic Spanish words and also Spanish real and pseudo-words that differed only in the position of the stressed syllable. The participants took part in three ABX tasks overall: one with real disyllabic word pairs (e.g., amo/amó; I love/he loved), another with disyllabic pseudo-words (eg. galfo/galfó) and then a final task with tri-syllabic real (eg. ánimo/animo; soul/I animate) and pseudo-words (eg. gámbaro/gambaro). The results show that L1 English listeners are able to use lexical stress in Spanish as a cue to distinguish between disyllabic word pairs, but they have some difficulty with trisyllabic words. English listeners tend to perceive ultimate stress in disyllabic words as penultimate and penultimate stress in trisyllabic words as ultimate. Pseudo-words accounted for 58% of errors seen in the results

Topics: Cross-language and nonnative perception, Intonation, Rhythm, Stress and accent

Pedagogical benefits from scrutinizing the acoustic correlates of two Swedish prosodic contrasts: word stress and quantity

Bosse Thorén, University West

For some decades, Sweden has had a great influx of immigrants, who need to learn intelligible Swedish pronunciation. To enhance the efficiency of the pronunciation teaching, Abelin & Thorén (2017) attempted to rank the Swedish prosodic contrasts with respect to their importance for intelligibility. Word stress and quantity were found to be more crucial for intelligibility than tonal word accent. This paper examines the acoustic correlates of the Swedish stress and quantity contrasts and ventures to make an educational point.

Traditionally, in Swedish, stress is regarded as a dynamic contrast while quantity is seen as a vowel length contrast. However, e.g. Fant & Kruckenberg (1994) found that stress is signalled mainly by duration, secondly by tone and peripherally by various spectral cues, while quantity is cued by vowel duration relative to subsequent consonant duration and to bigger speech units (Traunmüller & Bigestans, 1988). A spectral cue to quantity, like English 'tense' and 'lax' seems to play a minor role (Behne et al., 1998; Thorén, 2003). Therefore, many have concluded that they should teach learners to regulate vowel duration for the quantity contrast and syllable duration and tonal gestures for the stress contrast.

However, when the acoustic correlates are scrutinized, the extra syllable duration induced by stress is not evenly distributed over the syllable, but in accordance with the complementary pattern /V:C/ or /VC:/, as ascertained by Elert (1964). Thus, it is argued that learners need to learn to lengthen the correct segment in a stressed syllable: either the vowel or the subsequent consonant, to clearly signal both stress and quantity. Teachers and teacher trainers need to be informed that although the duration of the post-vocalic consonant is not shown to play a major role in signalling the quantity category, it helps signal syllable prominence and make quantity category extra clear.

Topics: Intelligibility and comprehensibility, Rhythm, Stress and accent, Training

Presentation Session: P3-26

Acoustic Features of English Contrastive Stress Produced by Chinese English

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Stress is a very important prosodic feature of English and a vital form of expression to convey key information. The difficulty for English native speakers in understanding spoken Chinese English (CE) is partly due to the CE speakers' failure to produce stress correctly due to the influence of L1 syllable-timed rhythm. The present study focuses on the contrastive sentence stress produced by Chinese English speakers compared to that of British English (BE) speakers so as to explore the acoustic similarities and differences between CE and BE in terms of pitch, duration, and intensity. The subjects are 2 RP phoneticians from Britain and 17 CE speakers currently doing their postgraduate degrees in China. The data were recorded in the phonetic laboratory and analyzed acoustically via Praat6019_64 and statistically via SPSS 21. Results indicates that BE speakers invariably place the stress on the content words of the sentence, whereas only near 2/3 of CE speakers can place the stress correctly and misplace stress on function words. As for the stressed syllables, their pitches in CE are significantly lower, pitch ranges are smaller, and durations are significantly shorter than in BE, but there's no significant difference in the intensity of stressed syllables between CE and BE. The findings provide empirical data and suggestions for the pedagogy of oral English pronunciation in China.

Topics: Stress and accen

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Konishi, Takayuki	Global Education Center, Waseda University	Japan	22C2, P1-21
Kopeckova, Romana	University of Münster	Germany	11A1, P1-02
Kornder, Lisa	Karl-Franzens-University Graz, Department of English Studies	Austria	P2-5, P3-15
Korneliussen, Kulunnguaq	Aarhus University	Greenland	13C1
Kruger, Franziska	Indiana University Bloomington	United States	12B3, 22A1

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Levis, John	Iowa State University	United States	11A3
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Michaels, Lila	Indiana University Bloomington	United States	12A3
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Mora-Plaza, Ingrid	Universitat de Barcelona	Spain	11C2, 22B1
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Suzukida, Yui	University College London	United Kingdom	12C1
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Ueda, Ruri	Osaka Kyoiku University	Japan	11C1
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Wang, Wei	Beijing Language and Culture University; Xinjiang University	China	P2-20
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Wang, Suwan	Yangzhou University	China	P3-26
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Wrembel, Magdalena	Adam Mickiewicz University, Poznan	Poland	31C1
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Yang, James H.	National Yunlin University of Science and Technology	Taiwan	23B3
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Yoo, Hiyon	Laboratoire de Linguistique Formelle, Paris 7	France	23A3
Yoshimura, Noriko	University of Shizuoka	Japan	P1-23
Yu, Shi	Institut de Linguistique et Phonétique Générales et Appliquées	France	31B2
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Zhang, Yuan	Universitat Pompeu Fabra	Spain	P2-17
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Zhang, Jiacong	LPP (Paris 3 – Sorbonne Nouvelle)	China	P1-14
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Zhou, Chao	Universidade de Lisboa	Portugal	23C1
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